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## MOSES—THE HEALTH OFFICER

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To a nation had been given birth, a nation destined to furnish the ideals which were to leave their imprints on all succeeding nations to the end of time, and with melody and dance, Moses and Miriam, as they gave praise for the deliverance, exultingly declared the fact. The waters of the Red Sea, still strewn with the debris of the Egyptian hosts, were for the fugitives an effectual barrier, as effectual to safeguard them from pursuit as to prevent their return to the flesh-pots of the land whence they had been delivered. Perhaps the faint-hearted among their number would have wholly despaired had they known that forty years of wandering among the Sinaitic wastes must yet be accomplished ere the next great scene in the drama was to open, forty years of death and dearth and rigid preparation before the Promised Land would be theirs. Not theirs even then, for, though their sons and grandsons might win entrance, but few of the survivors who now hearkened to those rapturous outpourings were to take part in that still greater and more important episode, when Jordan's banks were to be crossed and the foundations laid for a kingdom whose deeds were to affect the destinies of millions yet unborn. Their future it was to interpose themselves on the highway of travel between the civilization which in thousands of years had developed in the valley of the Nile, and the equally formidable colossus reared in the basins of the Tigris and Euphrates, boldly to seize and effectually to hold the citadel at the cross-roads, to levy tribute to the right as to the left, and to develop a system of religion, a school of thought and a code of laws which were to outstrip and far surpass any yet developed.

Their preparation for such an endeavor may have seemed scanty had there not been taken into account Moses, the Lawgiver, and his adviser, Aaron, the Priest. The latter had but recently proved himself the equal, if indeed he did

not surpass in knowledge of the occult, any of his former associates. At a stage in the history of medicine, when the collection of medical lore was a priestly function, we may safely consider that there had been available to him, and at his disposal, the soundest conclusions respecting medicine and health preservation which had yet been developed. Judging from our present-day standards, they may have had shortcomings which would prove serious if a reliance too implicit were imposed in them, but at least they were the most advanced and nearest approached the truth of any of his period, even as he himself had established his own personal proficiency. As ever, the advantage of the possession of the most advanced knowledge was great, even though that knowledge was itself to be surpassed. In a population of Lilliputians, Gulliver was a giant.

Undoubtedly, the Egyptians at the time of the Exodus were in possession of knowledge concerning the human body to an extent much greater than, for example, was possessed by their neighbors whose funeral rites did not include the process of embalming. There was also a well-developed medical literature. Six books of their massive encyclopaedia of forty-two volumes of general knowledge were devoted to the study of disease. Illnesses were systematically studied. Most careful attention was given to the means of procuring information respecting diseases and their cures. It was the custom to expose their sick in the market places in order that their attendants might receive from the passers-by information which might result in aiding recovery. Medical histories were taken and carefully preserved for study. If recovery from an illness took place, the erstwhile patient was required to proceed to the temple, and there place on record the story of his experience. Thus a mass of information had been collected, from which certain definite conclusions were drawn and certain definite lines of treatment followed. The priests, especially at Memphis, were entrusted with the collection and preservation of this material, and a very rigid adherence to established

methods of treatment was forced upon the medical attendant. If this method was departed from, the results were not pleasant to contemplate. The patient might recover; the physician unfortunately did not. Death was the penalty of a departure from any line of treatment which had been accepted as that which the collective wisdom of the priest-physician craft had determined to be the correct treatment for that particular complaint. It is to be surmised that any desire on the part of any practitioner to experiment or to introduce innovations was sternly repressed.

There was practiced, therefore, a wholly empirical medicine, one based entirely upon experience. Those who practiced it were undoubtedly, however, acute observers in all other fields of science, and probably had observed as correctly and had drawn deductions as accurately in respect of disease as they had done in other departments of knowledge. It is truly amazing that, denied the apparatus and the information now available to the veriest novice, they had managed to establish for themselves and to their satisfaction so many and so correct views of disease causation; that their minds had successfully leaped the chasms which modern science has learned successfully to plumb. It was not given to them to know the method of disease transference, but of many of the facts they were undoubtedly aware, so much so, indeed, that modern science but explains and corroborates many of the principles which they had learned to accept. Thus the thousands of intervening years but serve to establish the soundness of many of the basic principles of the Mosaic sanitary code. It was given to Moses, the administrator, to enforce the code established on the principles enunciated by Aaron, the priest and physician, and here were no frictions between the executive and the legislative.

In still another way, there was an immense advantage over modern-day practice. The executive of the present time, assuming that he has maintained himself in the forefront of his group in so far as knowledge of scientific principles is concerned, has only succeeded in gaining a vantage ground from which to direct his action. These actions depend wholly on the success with which he meets in securing legal authority to put his plans into execution. There are usually two courses open to him. He may

embody his wishes into the wording of laws and then strive, possibly vainly, to have these enacted by the legislature of his land. These laws must usually bristle with penalty clauses, and may be easy or impossible of enforcement, depending largely upon the amount of popular sentiment which can be elicited for support. A second method is the more elastic procedure of government by regulation, one often grudgingly obtained, and lacking in prestige what may have been gained in flexibility.

Appreciate then the old Israelite procedure. The sections of the Jewish laws relating to health were portions of the code as definite and decided as any therein contained. Infringement of these laws was a crime, not against Moses, who but served to enunciate them, not against the nation, for the idea of a national existence had hardly at that time come into being, but against God. If broken, the act was a direct challenge and defiance of deity itself, whose special protects the Israelites were. The whole trend of the teaching was that disease was an evidence of divine displeasure, that compliance with the law, including the health provisions, would bring for the conforming individual all the blessings which a gratified God could shower down, and that on the other hand, non-compliance might involve not only the individual, but his whole family, to the uttermost degree of relationship, in a common ruin. Disease might, by the Omnipotent, be used as a scourge to enforce obedience, as the Egyptians had discovered in the depths of their sufferings. An omniscient, ever-present and watchful God, to whom the innermost thoughts were bared, whose power was infinite and whose resentment against injury might be instant, stood ready to enforce compliance—compliance immediate, complete and unreasoning. Contrast the prestige of the Mosaic health laws with that of those now used to protect an individual or a community against disease. It was the province of Moses, the lawgiver, prompted by Aaron, the priest and physician, to act as the mouthpiece of a God very personal to every individual in the host, to issue commands which the boldest could not dare defy, to enforce compliance and obedience to an extent which no modern law or regulation can approach. There was not one single conscientious objector when on the banks of the Jordan, in readiness for entry into the Promised Land, the immediate cir-

cumcision of presumably one million males, all who had been born since Egypt was escaped from, was ordered.

The commands in respect of health were therefore the product of the most advanced medical knowledge of the time, backed by a weight of authority and prestige and power of enforcement surpassing anything conceivable under present-day conditions.

A general idea of the vital statistics of the nation can be quite easily obtained. When the Red Sea was crossed there were approximately 600,000 males capable of bearing arms, or above 20 years of age. If the proportion of males and females by age groups was present, such as was observed at the time of the last Delaware census, there were about 2,000,000 persons who found themselves involved in the forty years of preparation in the Wilderness. Already, in two years, the number of fighting men had increased, and the Levites were not counted. At the end of forty years, of the 600,000 first named, there remained alive but two individuals, indicating a general and average death rate of about 25 per 1,000 for that group of the population, if we assume that the group was being added to yearly by about the amount of the loss from lower age groups. We may assume that the death rate of the females of the same age grouping, another third of the population, showed approximately the same rate, and also that the remaining third, both males and females under twenty, may have suffered corresponding losses. On the other hand, the race was a prolific one, with a birth rate easily capable of compensating for a death rate far in excess of 25 per 1,000, possibly one of double that figure. Undoubtedly there was tremendous wastage, but undoubtedly, also, the race was a fecund one, which, with plural marriages a common practice, little needed any admonition to be fruitful and multiply. The famous excuse advanced to Pharaoh by the midwives, that the Jewish women were so "lively" that commonly the birth was completed before the midwife could arrive on the scene (which must have had some color for its acceptance), indicates that labor was an easy process, probably accompanied by few fatalities. A tremendous war wastage could thus be easily met.

With but two males over forty years of age among over 2,000,000 of population, it is safe to assume that cancer was a rarity. If consump-

tion or tuberculosis existed, it is extremely likely that it killed very quickly, being of the miliary, or rapidly progressive type; the chronic forms, which indicate the development of a measurable resistance, being probably entirely absent. At least while in the Wilderness, the Israelites' method of living, unhampered by the necessity of maintaining themselves in fixed abodes, was such as to aid in limiting the transfer of the infection, should any be present. The average age of the living and the average age at death must have been extremely low, probably not far in each instance from 15. (The average age of the living in Delaware at the 1930 census was 29.73; in 1931 the average age at death was about 51 years and 4 months).

With breast feeding the universal custom, a very large proportion of all infants born may have been saved. A birth rate, the equivalent, for example, of that observed among the Japanese women on the west coast of the United States, if accompanied by an infant mortality rate as low as there met with, would have provided for a yearly increase in numbers even had the death rate been as high as 40 or 50 per thousand. The height of the death rate was probably brought about more by war wastage than disease, death being the portion of the male, either death or captivity that of the females. If no quarter was given by the Israelites in their wars of conquest, it is little likely that any was granted them on the occasion of their meeting with reverses, and that they did meet with reverses is a matter of history.

It is regrettable that more knowledge of the diseases to which the Israelites were subject cannot be obtained from the writings which have come down to us. Those which are referred to are either little recognizable on account of ambiguous description, or the names now given them describe a different clinical entity. The land from whence they had come was notoriously an unhealthy one, teeming with population and subject to outbreaks of plagues and pestilences. The land where now they were to wander was as free from disease as Egypt is supposed to have reeked with it, dry, often barren, and sun-and-wind-swept uplands replacing the humid lowlands of the Nile River bottoms. Their withdrawal from the pathways of commerce safeguarded them from the diseases which followed the travel routes. It is true that there are accounts of the

presence of plagues, always accounted for and accepted as a divine visitation of punishment for straying from the paths of rectitude, but the admonition heeded, they shortly disappeared. The opinion appears to be that the plague here referred to was actually the plague as it today exists, particularly in its bubonic form. It is suggestive that, when described, it is often referred to as the Egyptian plague or botch, an instance of which many can be cited, of a dreaded disease being assumed to be the particular product of a despised or hated nationality. Malaria appears not to have been present.

There are references to a number of skin diseases, of which boils and itch seem to be familiar, though even here there may be some doubt respecting identity. The boils may have been the ailment known as "Aleppo boil" or "Baghdad sore," not furunculosis, and what is referred to as itch may not have been the disease caused by the scabies insect. There is also doubt concerning the ailment known in Scriptures as "emerods." The similarity of the name to haemorrhoids has led some to believe that the disease was that commonly known as piles, and the remark which is made that the Philistines were afflicted with the disease in their hinder parts is worth noting. On the other hand, the disease is referred to in such a way as to leave the impression that an outbreak was able to involve a whole community in its visitation, and who has heard of piles being contagious? Could an archaeologist but locate one of the golden images of an emerod made in a vain attempt to control an epidemic, one of the difficulties of identification might be circumvented. It would seem, taking everything into consideration, that the emerods were in fact buboes, possibly of plague origin. The skin affection known to the Hebrews as scald may have been eczema, seborrhoea, or impetigo. The rash of a yellowish tinge may have been a tinea.

In connection with some of the other infections, there are several interesting possibilities. In the first place, some of the diseases now well known may not then have been clinical entities at all. Evolutionary changes take place in respect of disease germs as they do in respect of other forms of life, and in the life history of each disease caused by a germ there must have been a period in which it was not toxic to man, but simply one of the vast number of organisms to

be found in nature. The process by which pathogenicity develops is entirely unknown and, at the time which is being considered, the boundary line may not have been passed in respect of a number of ailments. Farr, I believe, is authority for the statement that whooping cough appeared in Europe during the Middle Ages as an extremely fatal malady, causing the death of every individual attacked by it. The passing years have either mitigated the virulence of the organism or have developed resisting powers in the patient. A second possibility is that infections, then very severe, possibly very fatal, may not now be such. It is a well-known fact that smallpox is not now as fatal as formerly, and there seem to be changes, also, in the severity both of measles and scarlet fever from the classical descriptions of former years. There may have been a time when chicken pox was as fatal as smallpox now is, and who can say but that the common cold—now more of a nuisance than under ordinary circumstances a source of danger—may not be a vestigial remnant of an infection, originally of great killing power, but now making but slow inroads against a gradually developing immunity?

The situation as respects leprosy is extremely interesting. Undoubtedly there was an amount of the disease present which conforms in type with what is now our idea of the disease. Josephus, it will be remembered, takes especial pains to refute the slander that Moses himself was a leper, adducing as proof that he would not have been so strict in his treatment of them had he himself been a sufferer from the disease. On the other hand, it seems entirely impossible to accept the idea that there was not a great deal of looseness in the application of the term, and that it was the intention to apply the word to any of a large number of ailments having well-marked skin manifestations. Modern science knows little of the form of leprosy which turns the patient "as white as snow," though it does know that psoriasis may justify that description. It also knows nothing of a leprosy which can be of such short duration as two weeks, as was Miriam's, on the occasion of her running counter to a heavenly command. Her illness, at least, was entirely punitive. Whatever the term included, however, the idea of the capability of its transference to other individuals seems to have been generally accepted, though there seems to



be some difficulty in squaring this with the concept of the infliction of disease as a punishment. This may have presented no difficulties to an introspective individual, or one addicted to self-accusation.

It would seem to have been possible to make a tentative diagnosis of leprosy in respect of any of a number of diseases having obvious skin lesions. Wittingly or unwittingly, Aaron has fashioned a communicable disease regulation when he advised Moses of the procedures to be followed respecting the disease, which even today, if followed, would very adequately safeguard any community. The subject of any skin disease was immediately to be examined by a priest. If there was a doubt concerning the diagnosis, or if certain definite lesions were not present, the patient was shut up (isolated or quarantined is the present-day phrase) for a period of seven days. Another examination was then made, and, if necessary, another seven days of isolation was ordered, and it would appear to have been possible to extend even this period. When a definite diagnosis of leprosy was made, a definite procedure was laid down, the patient becoming an outcast whose place of residence must thereafter be without the camp. That there were made provisions to be observed in the event of a cure either is another indication that what was then called leprosy was not the disease to which the name is now given, or that some line of treatment had been discovered which was occasionally efficacious, but of which all record has been lost. On the other hand, if the opinion was that the disease was other than leprosy, a different procedure was to be followed. Here we almost imagine ourselves reading a modern regulation. The clothing of the patient was to be washed, he himself was to be shaved and to bathe himself, and eight days thereafter was to be considered cleansed, all restrictions being removed.

What it is particularly desired to stress is that, under that law, there are but few contagious diseases of which skin lesions are a factor, which could not be quite adequately cared for with a most measurable degree of safety to the general population. There might be twenty-eight days of isolation divided into periods of seven days each. This is a more rational procedure than the procedure later developed which insisted on a forty-day detention, the word quarantine, in fact, perpetuating the length of stay. Simple

washing with water and cleansing the clothing was equally efficacious and more reasonable than the burning of any one of a list of fumigants, which was the common procedure but a few years ago. Potentially, if not actually, the procedures were capable of controlling most of a certain class of communicable diseases as efficaciously as any we now use. Moreover, enforcement was relatively easy. This was a divine law, and every Israelite was concerned in seeing that the provisions of the law were observed. It is doubtful if the later Turkish expedient—that of which Kinglake tells us—of “carefully shooting and carelessly burying” the breakers of quarantine, could succeed in obtaining a compliance in any way comparable.

The leprosy concept could, moreover, be extended to act in respect of buildings in a way more drastic than any of our present-day housing regulations. If in a house wall there appeared a spot of color, such as might be occasioned by dampness or mildew, a tentative diagnosis of leprosy might be made. This entailed the removal of the spotted area, the destruction of the debris as unclean, and the rebuilding of the defective structure. If this treatment was not efficacious, the house could be ordered to be destroyed. Many of our tenement owners of the present day would certainly not appreciate any such provision as that in the building laws, and it is difficult to see how such a provision could fail to bring about the construction of well-drained and well-ventilated buildings. The specified construction of the coping stones on the flattened roofs of buildings bordering on narrow streets was a precaution, the rationale of which is quite obvious.

The sanitary regulations or laws were equally direct, simple, and efficacious. There were specific instructions respecting the burial of dejecta, and the spade for the purpose of providing the means for the immediate removal of excreta was to be as well-known an article of equipment in their armies as were the spears and swords themselves. The method taken to enforce obedience to this law again was founded on a principle wholly foreign to present-day thought, but one admirably calculated to ensure respect. The excreta, and in fact any discharges, were declared to be unclean and capable of making unclean anything fouled with them. This applied to the earth itself, which, so to speak, was the footstool

of Divinity and must always be maintained in a presentable condition. It applied also to the individual fouled with the discharges, who thus became unclean in the eyes of the priests and the people and was not then permitted to mingle with them. Temporarily at least, he had lost favor in the sight of that personal God whose children the Israelites were, and only after a certain interval and the performance of certain rites, one of which was washing with water, could he regain his old status. Specifically, there were certain instructions respecting certain discharges associated with sex or reproduction, the effect of which, possibly in an involved or round-about way, established an amount of sex hygiene which could not have been other than salutary. While doubtless an improvement over the customs observed at the time in other racial groups, nevertheless from the teaching there laid down, has by implication arisen a fetishism in the trammels of which we still find ourselves enmeshed.

Particular reference to the practice of circumcision might be made, though in no place does this seem to have been encouraged for its now well-recognized effect in promoting certain aspects of sexual health. There may have been certain tribes in Palestine who performed the operation for certain purposes before the commencement of the enslavement in Egypt. Among the Egyptians, it was the universal custom, and presumably was not carried out by the Hebrews during their detention in that country, being a distinguishing feature as between the two nationalities. When the period of the sojourn in the Wilderness drew to a close, the condition was quite exactly reversed. The Philistines, at whose expense they were to find lodgment, did not practice the custom, and one of the prompting ideas seems to have been that hereafter the Hebrew might be recognized by the fact of his being circumcised, exactly as when in Egypt he might have been recognized from the fact of his never having submitted to the rite. It was thus, so to speak, a racial shibboleth or means of identification, but the fact remains that by a somewhat devious route, and for an entirely different purpose, there had been adopted a custom quite universally now recognized as one contributing in no small degree towards the observation of a satisfactory sexual hygiene.

The food laws furnish still another instance of what might be considered an indirect but quite

efficacious method of preventing certain diseases capable of being transmitted through food. It hardly seems reasonable to believe that the art of cooking had then made very definite strides and that the effect of heat in the sterilization of food or parts of foods was satisfactorily understood. The tendency for food to be eaten raw, or but insufficiently cooked, seems quite obvious. The injunction, therefore, against the use of blood must have been markedly protective in nature, even though the reason on account of which the injunction was pronounced was in no way connected with health. There at least we seem to be on relatively sure ground. It is quite conjectural if the proposition is advanced that there may have been some reason based on experience which served to assist in drawing a line of demarcation between the clean and the unclean animals. There is no doubt of the ability for acute observation which these old priestly physicians exhibited. One can hardly resist speculating if there was not at least shadowy recognition of the fact that in the past disease had been carried by the flesh of certain animals. The case seems strongest in respect of the rock-loving coney, which was one of the interdicted animals. There seems to be little doubt but that attacks of plague as we now know it were by no means unknown either in Egypt or Palestine. We also now know that certain animals of that group to which the conies belong furnishes the reservoir from which overflow the attacks which even now at times decimate the human populations. That there was any connection is entirely conjectural, but again the fact remains that, in a way which appears to have been purposive, and by a wholly indirect approach, a line of defense had been created, a line flanked and fortified and buttressed by the concept that the interdicted animals were unclean in the sight of a jealous and a watchful deity.

Apart from the interdiction of the flesh of certain animals and fish, that portion of the law dealing with foods cannot be considered a remarkably complete document. There were general instructions concerning the avoidance of gluttony. During the experience in the Wilderness and a subsistence on manna and quails, these instructions at least could easily be carried out. Nor would the advocate of balanced diets, the bran enthusiasts, the spinach lovers, or those whose use of water in specified amounts

daily is the sine qua non of healthful living, find, either in the teaching or the practice, much in support of his or their beliefs. If, when in Arabia, the Israelites' experiences approached those of many of the nomads of the present day, it must have been one of their difficulties to learn how to subsist on a daily supply of water which according to our present-day standards is entirely inadequate. But, exist they did, possibly another example of the marvelous adaptability of the human organism.

Are we justified in considering their enforced periods of rest as one of the provisions likely to induce personal habits of health? In no place is the observance of rest days enjoined for that specific purpose. On the contrary, it is always referred to as an essential part of their worship, there being Sabbaths of years as well as Sabbaths of days, but whatever the purpose or whatever the means by which the national custom was brought about, the fact remains that the result was achieved, no doubt more efficaciously than it could have been secured had other reasons been advanced for the establishment of the custom. Again we see the instance of a result not the less valuable because it had been secured by an indirect approach.

The old Hebraic code was then an exceptional one. If there existed one among the contemporary national groups which could compare with it in workability, in prestige, or in efficiency, at least it can be said that knowledge of it has not come down to us. The question immediately presents itself as to the effects on the national future which the possession of the code had, and the proportion of the ultimate results which were brought about by the application of these codal principles. Egypt, whence most of the basic facts were obtained, is now known to us through its crumbling pyramids and architectural remains, though, since we are the product of all that has gone before, we still profit from its scientific achievements, accepted by its immediate conquerors and passed on by successive steps to us. Of the national or tribal groups which the Hebrews conquered and assimilated, there remain few, almost no records, and the imprints they made are almost wholly effaced. Not so the Israelites. There is hardly a human institution or belief today which is not affected by some phase of Jewish thought and this under every clime and literally the world over. How

much of this results from the fact that among their customs there were those based more carefully upon reasonable health practices rigidly enforced than were the customs of their contemporaries, memory of whom has almost disappeared? What were the practical effects on national existence which were achieved by the possession of such a code?

It seems wholly incontestable that there were practical results. Undoubtedly the general effect of the code was to lay the foundation of a system intended to insure the sanitary disposal of wastes, to limit the spread of certain infections, to initiate certain basic practices for the furtherance of personal hygiene, to aid in building up a virile and a fecund race, and to save lives. The lives saved by these measures may well have been the reserve which made possible the victory in the strenuous years of conflict before they had established their boundaries and consolidated their holdings. Without that reserve, they may have become but another familial group, condemned to a bitter and, in the end, unsuccessful struggle for a racial existence, among the many which have arisen on the Mediterranean shores. By reason of that reserve, they were enabled to establish a firm foothold and so to consolidate themselves, that advancement in other respects was possible.

Granting this, it must be conceded that the purpose for which any sanitary code is formed with them was most measurably achieved.

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## SANITATION IN DELAWARE

### EIGHT YEARS IN RETROSPECT

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Possibly a résumé of the work, attempted by the Division of Sanitation over the past eight years since its inception, will give to those interested in public health work some idea of the type and character of work done and its many ramifications.

Six months after the appointment of Dr. A. T. Davis as executive secretary of the State Health and Welfare Commission, the Division of Sanitation was organized, with the writer as state sanitary engineer and a milk inspector.

### WATER SUPPLIES

The first work consisted of a complete investigation of all the public water supplies in the

state, with reports submitted to the mayor or manager as the case might be as to recommendations for improvement when necessary. Since then these public water supplies have been periodically examined and bacteriological samples taken of each supply, the results of which are made known to the responsible authorities. The frequency of the sampling of supplies varies with the type of water supply, deep well supplies requiring less frequent sampling than such supplies as Arden and Richardson Park, the latter, however, having lately abandoned its more precarious source of water supply in lieu of deep wells. Arden, which receives its water from Naaman's Creek after sedimentation and filtration and chlorination, is sampled monthly. Numerous supplies have been added to and others changed, such as the iron removal filtration plant at Rehoboth. Others that have increased their water supplies are: Seaford, Laurel, Georgetown, Harrington, Dover, New Castle, Newark, Millsboro, and Richardson Park. Other towns in which new supplies have been installed are Magnolia, Townsend, and Greenwood.

Co-operation has been maintained with the City of Wilmington Water Department in the progressive cleaning up of the Brandywine Creek, resulting in a decreasing amount of human and paper-mill waste pollution. Only this past year, as a result of a nine months' study in 1930 of the Brandywine from Wilmington to and beyond Coatesville and West Chester, have extensive improvements been accomplished. After several conferences with the Pennsylvania State Department of Health and the City Water Commission, active construction work has begun for the building of a modern sewage treatment plant for Coatesville which will relieve the load of human pollution now entering the Brandywine Creek. At the same time West Chester has remodeled its existing sewage treatment plant and doubled its capacity, thus again lightening the pollution load. Coming closer to home, the installation of improved methods for re-using "white water" wastes at several pulp and paper mills have relieved somewhat the organic load on the Wilmington sand filters. Previously, very fine fibres coming from these mills could be readily identified on the sand mats of the Wilmington filter beds.

The expenditure of \$50,000 by the du Pont Company in 1932, after several joint meetings,

has resulted in the construction of an interceptor sewer to carry the experimental laboratory wastes down below the Wilmington water works intake. These wastes previously interfered with the delicate orthotoluidin test for residual chlorine, which latter is the final safeguard for the health of the 105,000 citizens of Wilmington.

An illustration of the need of some outside supervision and one reason why most states require approval by the State Board of Health of plans for water and sewerage improvements might be noted. One of the larger towns in the state contemplated a large combined sewer through the heart of the town down a steep incline and passing within 20 feet of the town water supply, which comes from a twenty-four inch concrete well 60 feet deep. The possibilities of joints leaking on such steep slopes made it imperative to reroute the sewer in order not to endanger the public, as well as to prevent the destruction of the investment already made in the town's only source of water supply. After some negotiation the town authorities agreed to choose another street for the outlet sewer. The above case is paralleled by a similar case now under construction. Contracts have been halted until a more satisfactory future location of the town's sewer, as well as that of a new state institution, have been located and the sewage adequately disposed of without endangering the town's only water supply, derived from a shallow but unfailing well supply.

#### SEWAGE PROBLEMS

Under the amendment to an existing law the legislature in 1927 gave to the State Board of Health the power to approve all plans for new or extensions to old water or sewerage systems. Under this law an attempt has been made to treat each case according to the circumstances. Many considerations enter into a discussion as to the disposal of the wastes of a community. With the exception of Newark, Clayton, and a very small percentage of the population of Wilmington (5,000) all municipal sewage is discharged into the several rivers without treatment. Several sizable towns such as Middletown and Harrington have no sewerage systems at all.

The attitude taken in the case of new sewerage installations has been to try and fit each case to the local conditions. In New Castle, where sewers and pumping stations have been



lately constructed, permission was given to discharge the sewage into the Delaware River a distance of 1,000 feet from the low tide line. The same applies to Claymont, whose system was completed in July. Incidentally, this is the first sewerage system constructed by any Levy Court in this state and was accomplished as a result of a law passed in 1927 superseding the sanitary district type of law advocated by the State Board of Health.

In the case of Richardson Park, where discharge must be made into a small stream, rather complete sewage treatment is required, including sedimentation, oxidation and chlorination. The same treatment, omitting chlorination, is employed at the small treatment plant recently constructed by Wilmington for a portion of its population located near the Shellpot Creek area.

As the City of Wilmington increases the amount of sewage treatment for its population progressive stricter requirements will be required naturally for the other communities contributing to the same bodies of water. Until that time arrives these communities should do no more than their proportionate share in attempting to clean up our streams. However, with smaller bodies of water available for dilution throughout the state, at least primary sedimentation should be required in most cases.

An illustration of the attitude of the State Board of Health is illustrated in the case of the State Hospital. Here the engineer recommended separate sludge digestion and sprinkling filters at an approximate cost of \$75,000, with the final effluent to discharge into the Christiana River. While desirable to have fairly complete treatment, it was felt that, with the untreated sewage of Newport entering the same stream only a mile or two above the proposed outlet and with half of Wilmington's sewage entering several miles below, there was less necessity for complete treatment here, and that that same money might be more advantageously spent for possibly the same purposes at other institutions where such large bodies of diluting water are not available.

#### SANITARY SURVEY

Sanitary surveys have been made during the past eight years of most of the towns of the state. Going a little farther ahead than most state health departments, we have made rather detailed surveys for sewerage systems, including

transit surveys. This has been done to enable a more accurate cost estimate for sewers to be made before the employment of consulting engineers. In this way some idea is obtained of the necessary amount of bonds needed to finance such improvements. The surveys have been reasonably successful in furthering agitation for improvements in both water supply and sewerage projects. These reports containing maps, cost estimates, photographs, etc., are sent to the mayor or other official and usually then explained at a mass-meeting. The list of towns in which such surveys have been made are as follows: Claymont, Richardson Park, Newark, New Castle, Middletown, St. Georges, Dover, Harrington, Milford, Greenwood, Rehoboth, Frankford, Millsboro, Townsend.

#### MILK CONTROL

Anyone interested especially in milk control work, and incidentally in prohibition (either side), would receive amusement from reading through the early history of milk control work in New York City which forms one chapter in the recent report "On Loose Milk." It seems the most active ingredient in starting the campaign for cleaner milk happened to be an anti-prohibitionist by the name of Harty, who objected to cow stables being located up against the rear walls of the breweries, which made it possible to dispose of mash from the distilleries. He termed such cows and such milk as "swill cows" and "swill milk." The unbelievably filthy condition of the cows and stables is quite graphically described by the writer. This is all introductory to the fact that while no comparison is implied, certainly a marked change in the quality of milk delivered in this state now as compared with that delivered eight years ago is true.

Some indication of this is recalled by the writer when one of the receiving stations' milk supply was sampled one morning for the first time eight years ago. The procedure in sampling for the sediment or cleanliness test was to take a can of milk, twenty or forty quarts as the case may be, and stir this up thoroughly with a long-handled dipper. About a pint of milk was removed, poured into the sediment tester and then by air pressure forced through a small cotton disc about the size of a half dollar. In one meritorious sampling fourteen flies were caught in one dipper full of milk! This fortunately has

established a record and probably will never be repeated.

During that same year a traveling laboratory owned by the American Child Health Association was loaned to Delaware, in 1924, and set up at Newark, Dover, and Georgetown and samples of milk bacteriologically examined from all dairymen in the surrounding towns. The average bacteria count (logarithmic method) was 175,000. More outstanding than this, however, was the percentage of dirty and slightly dirty milk sediment discs. The percentage of clean discs was less than 5%.

Last year's picture presents a distinct improvement. The average bacteria count was 29,000, and 70% of the sediment discs clean. Furthermore, our standards for clean discs have been stepped up, making it somewhat more difficult for the dairymen to reach this same standard.

This improvement has been accomplished through the co-operation of the average dairymen, and by a certain amount of tactfulness on the part of those making inspections at the dairy. But few prosecutions have been necessary.

In 1929 the State Board of Health adopted in the main the model ordinance of the U. S. Public Health Service which has been accepted, I believe, by 17 states, and adopted as an ordinance by 452 municipalities in this country. Thus a marked uniformity is developing slowly throughout the nation with respect to milk control work. In the standard ordinance, four grades of milk are permitted, with Grade "D" covering any milk. However, all grades must be properly labeled after bacteriological tests have indicated the particular grade. Having gone through six years of milk control work in this state, we felt we were able to drop Grades "C" and "D," permitting only Grade "A" raw or pasteurized with clean sediment discs and 50,000 per c. c. count, and Grade "B" raw with clean or fairly clean sediment discs and under 200,000 bacteria per c. c. This really amounts to saying that all milk must have a count below 200,000 with an opportunity for the more alert dairymen to sell Grade "A" or 50,000 bacteria count milk.

Furthermore, our state regulations definitely state what each grade demands, as far as equipment is concerned. This gives definiteness to the dairymen as well as to the inspector. Con-

trary to the average dairyman's viewpoint, which is usually centered in the barn, our emphasis, provided the barn is clean, whitewashed and has a tight ceiling, is put on the milk house and its equipment. It is here where every Tom, Dick and Harry's soiled bottles must be washed and sterilized, as well as the dairyman's own equipment. Since the possible spread of infection usually occurs in one of three ways, the diseased cow, sick dairymen, or unsterilized equipment and bottles, it is important that each dairy be thoroughly equipped to adequately cleanse and sterilize bottles and equipment.

Our opinion about the inspection and control of dairies is that the dairyman is the heart of the whole problem. If we can educate him to adopt cleanly methods and to watch his own health we have solved the main problems. Concrete floors and stanchions and beautiful barns are all right and save labor, but they don't necessarily produce clean low-count milk, as experience and our records will show.

Delaware probably has the most complete control over the selling of retail milk of any state in the Union. This is due to the generosity of the people through their legislature in actively supporting such work, and, of course due to the smallness of the state, where it is possible to frequently inspect dairies and to collect milk samples and return them iced to the laboratory within two or three hours. Under our present set-up, milk samples are collected from each dairyman outside the City of Wilmington (although we do collect samples from Clover Dairy and Fraim's Dairy regularly) in practically all of the towns in Delaware. Bacteriological and butter fat tests are made in duplicate and the results, including the original sediment test, forwarded to the dairymen. Every six months new grades are established after averaging the last six samples if, of course, his dairy and equipment meet the grade requirements. From three to six dairy inspections are made by the dairy inspector, and reports of the inspections left or forwarded to the individual dairyman.

While there are many improvements yet to be made, as physical examinations of employees, etc., marked improvement has been made over the past eight years, not the least of which is the fact that all milk sold in the state, both raw and pasteurized, is tuberculin-tested. Credit for this latter goes, of course, to the dairymen, plant

owners, and to the State Board of Agriculture, acting for the people of Delaware.

#### ENGINEERING DESIGN WORK

During the past eight years this department has designed and supervised the construction of waterworks and sewerage systems at state institutions, including water supply projects at Brandywine Sanatorium, Edgewood Sanatorium, Ferris Industrial School; sewerage projects at Brandywine Sanatorium, Edgewood Sanatorium, Ferris Industrial School, Industrial School for Colored Girls, State College for Colored Students, Industrial School for White Girls, and Stockley Colony. Many improvements are yet to be made, but it is hoped the next legislature will provide funds so that both water supply and sewage facilities will be complete at all the state institutions.

#### OYSTER INSPECTION

Anyone familiar with the old type of shucking house will appreciate the change for the better which the shucking house owners have made. While a portion of this change for the better was in process prior to 1925, the outbreak of typhoid in Chicago attributed to the consumption of contaminated oysters, gave a distinct impetus to the above improvements not only in this state but elsewhere throughout the Union. Suffice it to say, the proprietors of shucking houses in this state have either completely rebuilt their shucking houses or constructed entirely new ones. Today all oysters are thoroughly washed in mechanical blowers, using safe water and air under pressure. The process has eliminated much of the inert organic material as well as broken shells. The equipment, such as strainers or colanders, paddles, measures, etc., is usually of monel or other non-rusting metal. Oysters are received from areas where the overlying water is known to be safe. Physical examination of employees is required at the beginning of each season.

During this period the scores of water samples taken from the St. Jones, Mispillion, and Broadkill Rivers have indicated these rivers to be highly polluted, necessitating the condemning of these for oyster-growing purposes, unless said oysters are removed at certain seasons of the year and planted in clean water for a stated period of time. Bootlegging of such oysters has occurred. Last year, however, some improve-

ment was made in having most of the oysters transplanted to Rehoboth Bay and other places, to be taken up this summer and fall.

The real remedy as far as the creeks are concerned is the treatment of the sewage of the towns of Dover, Milford, and Lewes. This would restore these creeks to a satisfactory condition as far as the sanitary survey is concerned. In the case of Lewes, this may be accomplished cheaply if the Federal government opens up a new inlet into the bay, changing the discharge of sewage from the canal which now empties into the Broadkill.

#### SLAUGHTER HOUSES

During the past three years since regular inspections of slaughter houses outside of the City of Wilmington have been made, a marked spirit of co-operation has resulted in putting all slaughter houses, with one or two exceptions, on a much higher plane of sanitation. This is particularly true of the larger houses in the environs of Wilmington. During the operating seasons the houses are inspected once a month. Altogether there are 25 such plants.

A further improvement to look forward to is state inspection by veterinarians of all meat slaughtered, paralleling the work done by Federal authorities in those plants which pay for such services, as is true in several plants in Wilmington.

#### SOFT DRINK BOTTLING HOUSES

Inspections of soft drink bottling plants in this state are made monthly of some plants. In addition we license many concerns distributing non-alcoholic beverages from other states. Those plants situated within a reasonable distance of the state line are also inspected at least yearly. Decided improvement has also been noticed within these plants, several of which have been newly constructed in the last few years. All plants, with the exception of two, have modern bottle-washing machines using 3.5% caustic solution at 120 degrees F. as a cleanser. Separately screened rooms are set off for the handling of syrups and other perishable products. The chief factor in this industry now is the development of an esprit de corps to keep what equipment they now have in actual working order and to develop high standards of cleanliness. Bottling plants are licensed yearly beginning with July 1 of each year.

### INSPECTION OF CANNERIES

Each year during the running seasons two to three inspections are made of each plant. The chief obstacle to a high general plane of sanitation in the canning industry is due to the fringe of plants which open when conditions are propitious and hastily clean up the equipment, but usually never get out far enough from the plant to take any steps to improve sanitary living conditions. Considering the state of the industry as a whole our attitude has been to impress on the canner the need for better toilet facilities, and where camps are available better sanitary conditions there. Much improvement could be had if the overhauling of the plant and its surroundings started a little earlier in the season. From the canners' standpoint a considerable saving in depreciation would result, it would seem, if the plants were thoroughly cleaned immediately after the season closes and painting of equipment then begun.

Our activities concerning canneries have been concerned chiefly with the attempt to provide decent sanitary conveniences for the employees and their families. The water supplies without exception are satisfactory, since most of the canneries are located in areas where ample pure water may be readily obtained. Toilet facilities have been an aggravating problem, but on the other hand considerable improvement has been made, taking the industry as a whole. Some of the plants provide very satisfactory quarters for their help, such plants as Stetson-Ellison Company at Harbeson; Phillips Packing Company at Newark; and W. J. Warren Company at Lewes. Other well-kept plants are Watkins Packing Company at Odessa; J. W. Townsend, Jr., & Co. at Georgetown; Phillips Packing Company at Oak Grove, and others.

Trade wastes present a real problem, particularly the disposal of tomato wastes. Very little has been done in this state by the canners to adequately take care of these wastes in contrast to other states, such as Wisconsin and New York. Dependence has usually been put on the willingness of the adjoining property owner to bear the nuisance until the season is over. Examples of the need of some treatment for the tomato wastes are at the Phillips Packing Company at Newark, and of pea wastes at the Draper Canning Company in Milford. Decreased activity among the

canneries this year forebodes very little capital outlay for such improvements.

As handlers of food to be consumed by an unknown public, the canners as a whole have not shown the inclination to elevate their standards of sanitation as have the other industries described above, although the proportionate capital outlay would not be nearly so high as in the case of the other industries previously mentioned. Certainly the installation of water-borne sewage disposal, rest rooms and preliminary treatment of wastes where called for is not too great a burden for the average cannery, particularly if such improvements are planned so as to construct a portion of such improvements yearly.

### THE INVESTIGATION OF NUISANCES

Nuisances are of various stripes, colors, shapes, and forms. Many have practically no health significance. Many are the cause of spite work between adjoining property owners or tenants. On the other hand, many nuisances exist and are permitted to exist because the injured party does not care to create the inevitable bad feeling complaints do cause, for many persons endure obvious objectionable conditions because they are too timid to demand their abatement. Over 90 per cent of the nuisances reported to this office in writing occur within a radius of 10 miles of the City Building of Wilmington. Here we find individual home builders and note particularly contractors and promoters constructing homes, the former innocently, the latter more knowingly as to the impossibility, in many cases, of taking care of sewage wastes by means of septic tanks or cesspools, due to the poor leaching qualities of the sub-surface soil. Many a blushing bridal couple have found after the first three months that there is such a thing as a plumbing system attached to the nice little suburban home they built. They had been assured by the plumber that the "aseptic tank" purified the sewage 98 per cent! Apparently, this means a final effluent of 98 parts pure water and 2 parts sewage.

In most cases legal action is the only way a remedy is obtained. An excellent illustration of one way of handling such a group is shown by the experience at Claymont. Here at least one hundred properties have for years, despite the ability to finance abatement in the majority of cases, permitted the overflow from cesspools and septic tanks to enter state highway drains, thence



flowing through complainant's property. Persuasion failed. During this period, however, an attempt was made to have the legislature adopt a sanitary district law in 1927, which would permit incorporated communities to organize districts according to topographical criteria rather than by political boundaries, and thus construct water and (or) sewerage improvements by choosing an elected commission with power to issue bonds after said issue had been approved by the inhabitants of the said sanitary district. This bill failed of enactment but was replaced by a county sewer law which permitted the Levy Court of New Castle County to construct such sewer systems, the cost to be borne by the benefited property owners. Thus the Levy Court becomes the financial carrying agency rather than the proposed above commission.

The county sewer law has thus made it possible to bring about the permanent abatement of the hundred or more nuisances in Claymont, rather than individual attempts at abatement which would be as costly as the recently constructed sewers, and hazardous as to permanency. While a long-drawn-out battle has ensued, a permanent solution has been found and at an equitable cost.

Richardson Park, another community of many nuisances, is also solving its problem permanently by the construction of a sewerage system, including complete treatment of the sewage. This system is also being constructed under the county law act.

Suggested improvements to the county law would be to amend it to permit the construction of water systems, and to permit the spreading out of assessment costs plus interest over a five-year period. This would spread the individual costs so that no great hardships would be imposed on the average home owner for these very necessary community improvements.

Individual nuisance abatement is the cause of much acrimonious debate, injured feelings, and finally legal action. However, every citizen aggrieved should by all means be privileged to appeal for relief, and from the public health standpoint abatement is necessary.

#### PRIVATE WELL INVESTIGATION

Numerous samples are collected of private wells, swimming pools, ponds, etc. Many water samples are sent in by individual tenants and

landlords. In the case of unsafe water supplies, privately owned, the State Board of Health has no jurisdiction. In the case of public supplies such as at service stations, it does. Hundreds of samples of water have been taken from service station wells. At least 100 wells have been posted with an aluminum "Safe Water" sign by the State Board of Health. These are examined yearly.

In the case of the unsafe private supplies, the State Board of Health has instituted a service of inspecting such wells, advising the landlord or tenant how to remedy any defects and instructing him how to disinfect the well.

#### CONCLUSION

The interest on the part of the public in sanitation increases yearly, indicating that the work of the newspaper, the radio, and public health organizations is bearing fruit. Unquestionably this interest will expand and standards will be progressively raised.

### RICKETS AND TETANY

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Rickets is a public health problem of considerable magnitude. It deserves efforts at community control. The prevention of the disease should be made a special point of attack. The facts that the disease is common and serious and can be prevented by sunshine and cod liver oil should be broadcast until they become common knowledge.

For many years rickets was looked upon as a disease of malnutrition in which there was a deficiency of mineral salts, particularly of phosphorus and calcium. Many theories have been advanced as to whether failure on the part of the infant to assimilate them, or their too rapid excretion from the body was the principal cause of trouble. It is only comparatively recently that the theory of the disproportion between the amount of phosphorus and calcium in the system has been looked upon as playing a greater part than the deficiency in the amount of either or both present in each case. So much importance is now attached to this fact that two forms or kinds of rickets are recognized as occurring separately and distinctly from each other, one, in which the calcium is low and the phosphorus

normal or above, being referred to as low calcium rickets, and the other, in which the phosphorus is low and the calcium normal or above, as low phosphorus rickets. Many authors have been working on this matter, their views being based on the experimental production of rickets in rats, followed and supported by clinical observations in both private practice and institutional work. At a glance this may not seem to be a matter of great importance, and yet, if a physician should administer phosphorus to the limit in a case of low calcium rickets, in which phosphorus was normal or above, you can readily see that, even though no harm was done by the excess of phosphorus in the system, there would be considerable danger of tetany developing due to the prolonged period of calcium deficiency. On the other hand, suppose conditions were reversed, and calcium was being energetically administered in a case in which it was already normal or above, while the infant's system was craving phosphorus, which might be fifty per cent or more below normal in the patient at that time, one must admit that, to say the least, the rachitic condition would not be helped, even though the baby was not harmed.

It is perfectly proper to administer both calcium and phosphorus in all cases of rickets, and I grant you such is usually the case, but I submit that to give the maximum of the one that is deficient and the minimum, if any, of the one that is normal or above would surely produce better results in a shorter space of time, and tend to head off some of the complications and sequelae that are frequently so disastrous to these patients, either in costing them their lives at the time, or in deforming or crippling them for life afterward.

Delay in the proper treatment of a case may have had results, according to whether it is a low calcium rickets or a low phosphorus rickets. It is in cases of low calcium rickets that tetany occurs, and in such a case it is the calcium that one should be pushing the hardest, and giving but little, if any phosphorus, as the amount of this ingredient present will be at least normal, if not above. To head off the development of tetany the child should be calciumized as quickly as possible.

Tetany may occur independent of rickets but it is at all times a low calcium condition, whether it be present as a symptom of or entirely inde-

pendent of rickets, and in any event, therefore, it is the use of calcium that is indicated and not phosphorus.

Hess divides the causative factors into four classes: 1, dietetic; 2, hygienic; 3, infectious; and 4, endocrinous, but admits that the latter two play a small part, if any, the dietetic and hygienic factors forming the solutions for the pathogenesis of rickets. He also calls attention to climate, environment, season, age, heredity, and prematurity as predisposing or exciting factors, or both, all of which have no doubt been noted at various times in different cases by all. As to season, both the bottle and the breast-fed baby are affected, the condition being worse in the winter and spring. As to age, from the sixth to the sixteenth months furnish the larger number of cases. Heredity is only a predisposing factor in exceptional cases.

Prematurity plays an important part in many cases due to the fact that the mineral contents of prematures is below normal, as two-thirds of the minerals are deposited during the last few months of fetal life.

Underfeeding is another factor in the development of rickets in the premature. The low calcium content of human milk and the difficulty of metabolizing even this food in sufficient quantities to prevent drawing on the inherited supplies may be an active factor. When we come to take up the question of diet as a causative factor in a given case we may have quite a problem on our hands. I feel, as do many others, that prolonged breast nursing, such as is so common among negro and Italian races, is a fruitful source of trouble, and serves largely to explain the existence of rickets in breast-fed babies. When it comes to the bottle-fed baby, we have an even greater problem on our hands. It has been estimated that cows' milk contains five times as much phosphorus as human milk and four times as much calcium, and yet we have by far the greater percentage of cases of rickets in the bottle-fed baby. What is the explanation? Many theories have been advanced, all no doubt of some value, but, personally, I believe the association of hygienic conditions in many cases, such as deficiency of sunlight and fresh air, neglect of such body functions as digestion and bowel action, deficiency of elimination, especially by the skin, due not so much to lack of bathing as to improper clothing. We used to give more consideration

in association with diet than has been our custom in the past, as we have been in the habit of looking upon these cases as being too exclusively due to diet. As to the question of calcium metabolism in relation to the great amount of this material present in cows' milk, we find thirty-five to fifty-five per cent of the calcium intake was absorbed. An excessive calcium intake did not increase the calcium absorption, as the excess was excreted.

McCollum believes that in infants the reason that rickets develops is because the dilution of milk is such as to destroy or alter the proper mineral proportions when nothing else is added to the diet. Voit asserts that excretion of calcium is almost entirely through the intestines, especially the large bowels, only five to ten per cent being excreted by the kidneys. When we take up phosphorus metabolism we find conditions in many respects are quite different. Schabod states that two-thirds more of the phosphorus is normally excreted by the kidneys, the rest from the bowels, the proportion being eighty to twenty in the breast-fed, and sixty to forty in the artificially fed.

Among the earliest signs of rickets are fretfulness, irritability, restless sleep, excessive perspiration about the head, especially when eating and sleeping, pallor, constipation frequently alternating with diarrhea, pot belly, umbilical hernia, a general backwardness in physical development. There is usually a delay in the closure of the sutures and fontanelles, the anterior fontanelle not being closed by the eighteenth month, as it should. The earliest changes in the skeleton are the so-called rachitic rosary, Harrison's groove, the squared head, flattened on top, and with marked frontal and parietal eminences, and the nodular enlargements in the long bones at the junction of the epiphyses and diaphyses. Dentition is frequently delayed, the teeth are often irregular, and the first teeth are subject to decay. Other changes in the skeleton that develop later are kyphosis, scoliosis, and bow-legs.

Prognosis—rickets is essentially a chronic condition, although its duration may be materially influenced by the proper treatment, and particularly if that treatment be started early. Rickets is never fatal, but is a most important factor in reducing the child's resistance and impairing its vitality, thus increasing its susceptibility to vari-

ous infections and diseases, especially those of the alimentary and respiratory systems. Death may result from spasmophilic manifestations, more especially convulsions. Tetany is frequently associated with rickets because rickets is a disease in which the calcium in the body tissues and fluids is subject to variations. Tetany may occur independent of manifest rickets. Since tetany may occur with the low phosphorus form of rickets it does not serve to mark off one form of rickets from the other. Tetany is associated with low calcium form of rickets, and, for all practical purposes, the low calcium form of rickets is the rickets of tetany. Many cases of rickets exist in which tetany does not supervene.

As in rickets, diet, prematurity, age, and season play a part in the etiology of tetany. So far as diet is concerned, however, while we see many cases of rickets in breast-fed babies, we rarely see cases of tetany among the breast-fed. In fact breast feeding is one of the best methods of treating a case of tetany, and will produce the most prompt results in its cure, cows' milk and proprietary foods seeming to be the principal offenders. Breast feeding has a more beneficial effect in the prevention of tetany than it does in the prevention of rickets, largely, perhaps, because tetany is associated with low calcium, while rickets may be due to either low calcium or low phosphorus. Concerning the effect of season, here again both the time of the year, and etiological factors run parallel with rickets, which is equally true when it comes to age in its relation to tetany.

Kramer found that in children suffering from rickets alone, the phosphorus of the blood serum is low, and the calcium not far removed from the normal; in children suffering from tetany complicating rickets, on the other hand, the calcium is low but the phosphorus not far from normal.

Prognosis of tetany should always be guarded, although, on the whole, it may be said to be guardedly favorable, but many things play a part in influencing the prognosis, such as the frequency and severity of convulsions, the presence of an enlarged thymus, such complicating diseases as pertussis, and the presence or absence of associated rickets. The prognosis in each case of tetany is a law unto itself. In most cases of rickets if the child recovers there are no bad

after-effects, yet in some cases of tetany the chilnervous manifestations or mental retardation. dren show for years after their recovery various

The treatment of rickets and tetany, their close relationship to each other, from the viewpoint of etiology, makes the treatments similar. In both cases diet is the first and most important factor, and human milk by far the most valuable article of food for these patients, provided that they are under the age of one year, but after this age human milk is one of the most common causes of rickets. Of course, the diet of the mothers in these cases is as important as that of the infants and needs to be as carefully investigated. Plenty of milk, eggs, butter, and green vegetables are essential, meat not being nearly as productive of calcium, phosphorus, and vitamins as it is given credit for. Human milk is most important, but if mother's milk is not available in cases of rickets, cows' milk will be the next best form of food, but not in cases of tetany. In tetany, goats' milk, well-cooked gruel, fruit juices, soups made from vegetables, cereals and meat, are preferable to cows' milk, and if the case be one of tetany only that is without rickets, this diet would be an excellent prophylactic against the development of rickets. Fruit juices should be started at the third month in bottle-fed babies, and at the fifth month in breast-fed babies, giving equal parts of fruit juice and hot water, an ounce of each, sweetened to taste, between feedings.

Next to diet in the treatment of these cases comes the effects of the sun's rays, and these infants should spend several hours a day outdoors in the sunshine, or the ultra-violet rays may be used with beneficial effect. So far as the treatment of rickets and tetany goes, cod liver oil heads the list of remedies both for its prophylactic and its curative value. If phosphorus is added to the oil in doses of 1/200 of a grain of phosphorus to one dram of cod liver oil, the benefits are even more marked in cases of low phosphorus rickets, while in cases of low calcium rickets, or tetany, either separately or in association, some form of calcium should be added to cod liver oil, as syrup of the lactophosphate of calcium, in dram doses.

## RABIES

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Rabies is an infectious disease caused by a virus, the nature of which is not entirely understood, but which seems to have an affinity for the central nervous system. It is an affection of the canine race, especially dogs, but it may affect any warm-blooded animal, including birds. It is of particular importance because, as is well recognized, the malady is readily transmitted to man as a result of bites inflicted by the lower animals. Probably no other disease of man is feared or dreaded so much as hydrophobia.

Rabies is probably one of the oldest diseases in existence, but because of the occurrence of so few human cases, and because the disease develops so long after the bite, its source was for a long time not known, nor was it recognized as a separate disease. Celsus, in the first century, was the first to give in writing a detailed description of human rabies. He used the term hydrophobia. In 1804, Zinke, studying rabies in dogs, demonstrated the infectiousness of the saliva. It was 75 years later, however, before any appreciable amount of research was undertaken by laboratory workers. In 1879 Galtier showed that rabies could be transmitted to rabbits through artificial inoculation, and that they developed the disease in the "dumb" or paralytic form. These findings developed a convenient and safe method for experimental study of hydrophobia and marked the beginning of more extensive investigation of the malady.

In 1881, Louis Pasteur, with his associates, Chamberlain and Roux, found that the virus of rabies had a special affinity for nerve tissue, it being found concentrated in the central nervous system. During the next few years (1881 to 1888), the brilliant work of Pasteur, which culminated in the perfection of a successful method of immunization against rabies, was accomplished.

The diagnosis of rabies in dogs had been carried out by Pasteur, as well as many others, through subdural inoculation of brain material into rabbits. This process required two or three weeks, or longer, making it of small value to any person exposed to the disease. Wilson, working in the New York City Health Department Laboratory, reduced the period to nine



days by the use of guinea pigs. It was not until 1903, however, that Negri, an Italian, of Pavia, Italy, described the finding of a certain type of "body" in the cells of the central nervous system, especially in the large ganglion cells of the hippocampus major, and in the Purkinje cells of the cerebellum in animals dead of rabies. These bodies are round or oval and vary in size between wide limits (0.5 to 22 microns). Numerous other investigators soon confirmed his observations that such bodies were diagnostic of rabies. Thus the well-known method of diagnosis of rabies was established.

#### SEASONAL PREVALENCE

The fallacy that rabies is a summer disease is based upon the fact that during the months of July and August the dog star "Sirius" rises with the sun. In ancient times this was considered the cause of dogs going mad, hence "dog-days." However, during this period dogs have a greater freedom than in winter, thus more opportunity for contact with each other. In reality, there is not an increase of rabies in the summer months. During the hot weather, very often dogs become cross and are suspected of rabies when they are not infected.

#### THE INFECTIOUS AGENT

The nature of the infectious agent of rabies is not entirely understood. Under certain conditions it can be passed through a Berkefield filter, thus placing it among the filterable viruses. By centrifuging the virus may be thrown down, leaving the supernatant liquid free of infectious material.

The virus is found in the nerve tissue, saliva, urine, lymph, milk, and other body fluids of infected animals. It may be present in the saliva five days before the animal shows symptoms, and it may also be present in milk and other body fluids several days before the animal shows symptoms.

Rabies virus is not very resistant to unfavorable environment. Sunlight destroys it rapidly, while exposure to air and drying soon renders it inert; boiling immediately destroys it, but at a temperature of 58° C. it requires 30 minutes. The ordinary disinfectants require more time for its destruction than for bacteria. Wyrowski showed that the gastric juice quickly destroys the virus.

#### PERIOD OF INCUBATION

From the standpoint of prevention it is fortunate that the period of incubation is prolonged. The period varies from 14 days to a year or more. It depends upon the amount and virulence of the virus, and the nature and site of the wound, especially with reference to the nerve supply. The average periods are as follows: dogs, 14 to 60 days; cats, 14 to 60 days; cows, 14 to 80 days; horses, 21 to 90 days; hogs, 21 to 60 days; sheep, 21 to 60 days; goats, 21 to 60 days; birds, 14 to 60 days; rabbits, 9 to 90 days; guinea pigs, 8 to 60 days.

In man, the incubation period may vary from 14 to 90 days, according to the location and extent of the wounds. If the head and face are badly lacerated, symptoms may appear in as short a time as 10 days; if the wound is on an extremity and slight, symptoms may be delayed for weeks and months. Several cases of an incubation period of over a year have been reported. Women show a shorter incubation period than men.

#### A SUSPICIOUS OR BITING ANIMAL

When a dog acts suspiciously, or when he bites a person, he should not be killed. On the contrary, the dog should be securely chained or confined in a safe place and provided with his regular food supply during an observation period of at least two weeks. If available, a veterinarian should observe the dog. If the dog remains well and healthy throughout the two weeks, he may be released, and any person whom he may have bitten need have no fear of developing rabies. If, on the other hand, the dog should manifest the symptoms of rabies, he should be permitted to die. The head then should be detached, packed in ice in a double tin-lined container, and rushed to the Laboratory. After the results of the examination are known, plenty of time will remain for starting the Pasteur treatment in any persons who have been infected, an exception may be made of a bite on an exposed part without clothing. It is well known that the period of incubation is much shorter for bites on the face and hands. In such cases treatment should begin at the earliest possible time.

#### HOW TO TREAT DOG BITES

First: Call a physician. He will properly cleanse and dress the wound so that the possi-

bility of infection from any disease, including rabies, will be less likely to occur than otherwise.

Second: The dog should be captured alive, if possible, and placed under observation after the manner prescribed above. In case the dog is killed for any reason, his head should be detached without mutilation and forwarded to the Laboratory, where examination for rabies can be made.

Persons who should take the Pasteur treatment may be classified as follows:

- a. Those who have been bitten, scratched, or otherwise wounded by an animal known to be rabid.
- b. Those who have fresh open wounds in the skin which have been exposed to the saliva, lymph, milk, or other body fluids of an animal known to be rabid.
- c. Those who have been bitten or otherwise wounded by a sick animal that has exhibited the symptoms of rabies, even though a definite diagnosis of rabies has not and cannot be made.
- d. Those who have been bitten by apparently healthy animals that were subsequently destroyed, or for other reasons have not or cannot be observed in the manner described above.

### TYPHOID FEVER ANTITOXIN

STANLEY WORDEN, M. D.  
Dover, Del.

Steady progress in sanitation, combined with the effect of an increasingly large proportion of the population that has received the protection of inoculation, has operated to reduce typhoid morbidity figures. The ratio of deaths to cases has, however, not been affected to any remarkable extent. Consequently any procedure which offers reasonable expectation of influencing this ratio is deserving of more than passing interest.

Dr. Gregory Schwartzman, Mt. Sinai Hospital, New York, informed Dr. Jost, of the Delaware State Board of Health, that the laboratories of that hospital had developed a serum that they felt was of distinct benefit in the treatment of typhoid fever and offered to place the serum at Dr. Jost's disposal for clinical trial in this state. Shortly after this offer was made a patient with typhoid fever was admitted to the Kent General Hospital in Dover, and on application to Dr. Schwartzman the serum was supplied by him, and administered to the patient.

W. G., negro, aged 30, was picked up by the state police while wandering in the woods near Camden, Del. He was brought to the Kent General Hospital, Dover, for examination before being placed under arrest. On admission the only history obtainable was that he had suffered no acute illnesses in his life, and that for the past two weeks had lived in the woods eating and drinking what he could obtain under those circumstances. Temperature, 104.2; pulse, 106, soft, dicrotic; mouth, dirty; eyes, ears, nose, negative; there was a mild cough without expectoration but examination of the lungs was negative; heart negative; abdomen distended, no organs felt, no tenderness; neurological examination negative. The urine showed a faint cloud of albumen; the white blood cells were 5,800 per cu. mm., p. m. n. 68%, lymphocytes 24%. The day following admission the temperature ranged from 102.4 to 104.2; the agglutination test was positive for *B. typhosus* in dilution of 1-320 and negative for para "A" and "B" and *B. abortus*. On the sixth day in the hospital he was given 100 cc. of the Mt. Sinai serum intravenously, followed by two more doses in the next two days. The temperature range on the day before the first injection was from 101.4 to 103.2 and on the third day after the last dose (or the sixth day after the first dose) the temperature ranged from 98 to 99. One week after the first injection he developed a mild serum reaction, characterized by tender joints, conjunctival injection, and temperature to 102. These manifestations lasted only two days, and he has been well for two weeks since. During his illness he received no other treatment, he was fed on a high caloric diet, and was given mineral oil for mild constipation.

In evaluating the results notice must be given to the fact that this was not a severe case, that the patient may have been in the declining stage at the time this treatment was instituted but there was an apparent prompt and definite influence on the course of the illness. This note is being published in the hope that practitioners may feel impelled to apply the therapeutic serum to cases of typhoid fever occurring in their practice. The State Board of Health at Dover is in contact with Dr. Schwartzman, and will undertake to obtain the serum for treatment of any cases arising in this state.

## A REPORT ON TUBERCULOSIS AND HOOKWORM

C. A. SARGENT, M. D.  
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To obtain an idea of the incidence of tuberculosis among special groups of Delaware children a Mantoux testing and xray program was undertaken in May, 1932. For various reasons it was not thought advisable to attempt to test all school children. One school in each county; a colored school, an orphanage, and a health center in Wilmington were selected as sources from which to obtain a fairly representative group.

Not all children in these schools and institutions were tested. Special groups were selected. A questionnaire was sent to each home to determine those children who were, or had been, in contact with active cases of tuberculosis and who had had measles or whooping cough or both during the previous eighteen months. The measles and whooping cough cases were included because several had already been examined at the clinics as a routine follow-up measure to determine whether such cases were prone to develop tuberculosis.

After the consent of the parents was obtained the intracutaneous or intradermal test was administered. One-tenth cubic centimeter of solution diluted to contain one-tenth milligram of old tuberculin was injected with a 26-gauge needle into the skin of the forearm. The reactions were observed forty-eight hours later. The degrees of reaction with redness and oedema ten millimeters in diameter were recorded as one plus. Reactors from the ten to fifteen millimeters in diameter were designated as two plus, and those more than fifteen millimeters in diameter were recorded as three plus. No reactions were accompanied by necrosis.

A total of three hundred ninety-six Mantoux tests were administered. There were one hundred fifty-seven reactors. Of this number sixty-one were one plus reactions, fifty-nine were two plus and thirty-seven were three plus. There was practically no uniformity of reactions in the various schools and institutions when all groups were considered. In the rural New Castle school thirty per cent reacted, in rural Kent forty-one per cent, in Sussex twenty-nine, colored school in Wilmington thirty-five per cent, orphanage in Wilmington fifty per cent, and among the health

center group fifty-four per cent. When the cases were tabulated by age groups there was little difference in the percentage of reactors, although the percentage of reactors over ten years of age was slightly higher than under that age. Another classification of the cases into tuberculosis contact, and measles and whooping cough, brought out the fact that the contact group percentage was nearly double the measles and whooping cough group. This, I believe, accounted for much of the difference in percentage among the groups from the various sources. The health center group were practically all contact cases. Approximately fifty per cent of the orphanage group gave definite histories of contact and upon many of the remaining number no definite history could be obtained, so that several more might have been contact cases. In all groups the greater the number of contacts the higher the percentage of reactors. If conclusions may be drawn from these studies, it is my opinion that if a Mantoux testing campaign was conducted throughout the state the non-contact cases would not show a percentage of reactors of more than twenty to twenty-five per cent, whereas the contact cases would be nearly double that percentage.

One hundred thirty-two reactors have been xrayed at Brandywine Sanitarium. This was made possible through financial aid from the Delaware Anti-Tuberculosis Society, whose secretary and directors are keenly interested in this type of work. The interpretation of the xray findings is as follows: healed glands, twenty; soft glands, three; strands, twelve; childhood tuberculosis, six; adult pulmonary tuberculosis, seven; and suspected cases, four. These findings are interesting when one considers that in all cases neither the child nor the parents were aware of these facts. The cases were not referred by physicians, in fact in no case had a physician been consulted for the condition. One of the adult pulmonary cases was captain of a school basketball team and played throughout the winter months. All had been attending to routine school duties.

The tuberculosis records of the State Board of Health alone contain the names of more than eight hundred children known to be, or to have recently been, in contact with active pulmonary tuberculosis. If the Mantoux testing and xray program can be extended to include this group it would seem that much can be accomplished,

not only in the detection and treatment of cases but in removing sources of infection dangerous to others.

To quote from "Tuberculosis Among Children," by Dr. J. A. Myers, "As the incidence of tuberculosis infection decreases the value of the tuberculin tests, particularly the intracutaneous, increases. Thus, no examination of a child is complete unless a tuberculin test has been applied."

If a sufficiently large group of children, not having had measles or whooping cough and who were not contact cases, could now be tested, it would be interesting to determine what effect, if any, measles and whooping cough have as a predisposing agent to tuberculosis as determined by the Mantoux test. Tuberculin testing of all children would be ideal; however, it is my opinion that for practical purposes the Mantoux testing and xray of reactors of children known to be, or to have recently been, contacts of active tuberculosis cases, and all children entering institutions would furnish sufficient data with which to formulate a constructive anti-tuberculosis program among children. Children entering institutions are included because of the difficulty of obtaining accurate history of contact with active tuberculosis, and because of their intimate association with others.

Under the direction of the National Tuberculosis Association a preparation for tuberculin testing known as MA 100 has recently been produced.

The conclusions from an article entitled "The Present Status of Skin Reactions in Tuberculosis and Nontuberculous Subjects" in the American Review of Tuberculosis, Vol. XXV, No. 3, March, 1932, by E. S. Mariette and E. P. K. Fenger, are as follows:

"1. MA 100 human protein is as sensitive and as selective as O. T. and probably more so.

2. The initial and repeat doses recommended for the MA 100 human protein are safe, in that dangerous reactions are not encountered.

3. The initial and repeat doses recommended for the MA 100 human protein are large enough to pick out the majority of tuberculous individuals and apparently do not need to be increased.

4. The MA 100 proteins are apparently not specific, in large doses at least.

5. There is apparently a protein substance common to all acid-fast bacilli, which, if given

in large enough doses, will elicit the same type of reaction as that obtained from Old Tuberculin.

6. As the MA 100 protein represents a substance in a purified form which can always be reproduced at the same isoelectric point and which can be weighed out in milligram doses, so that the exact milligram content of the solution is known, it is a better testing substance than Old Tuberculin.

We have found the study of sufficient interest to recommend it to clinical men for further study. We believe that the sooner physicians begin to use the same substances and the same standards for determining the severity of reactions, the sooner will we get comparable results."

Definite conclusions cannot be drawn from the three hundred ninety-six children tested. yet it is my opinion that the findings are of sufficient importance to justify the consideration of conducting a state-wide campaign of tuberculin testing of all known contacts, and subsequently xraying the reactors.

#### HOOKEWORM SURVEY IN SUSSEX COUNTY

Climatic conditions in Delaware are not favorable to the development of hookworms. Mainly because of this fact it has not until recently seemed advisable to conduct a hookworm investigation. Occasionally physicians have requested that feces be examined for hookworm ova; however, at no time have the ova been found in feces of Delaware children, in the State Board of Health Laboratory. Recently an area in another state in approximately the same latitude as lower Delaware was found to be infested with hookworms. This prompted us to undertake a hookworm investigation.

The hookworm (*Necator americanus*) inhabits the small intestine of man. The infestation is largely confined to the tropical and sub-tropical regions. The hookworm is not reproduced within the body of man or animal, but the ova passed in the feces mature in the soil. Sandy soil is essential for hookworm development. Freezing of the soil to a depth of a few inches will destroy the ova. Hookworms do not move laterally, but may move up and down in the soil to obtain the necessary moisture. Insanitary conditions contribute to the spread of hookworms, because feces containing the ova when deposited upon sandy soil in a tropical or sub-tropical region infest the soil at that spot. For



the most part, man becomes infested with hookworms through the skin, usually of the feet. When a bare-footed individual steps on hookworm-infested soil the worms pierce the skin, causing so-called "ground itch," get into the blood stream, are taken to the lungs, are coughed up, swallowed, and upon reaching the small intestine attach themselves to the mucous membrane. It is not uncommon in a hookworm treatment campaign in heavily infested areas to remove several hundred worms from an individual.

In July, 1932, a survey to determine the presence or absence of hookworms in Delaware were conducted. A careful selection of feces specimens was made. Families were selected in lower Sussex County, living in the country on sandy soil, having insanitary conditions about the homes, and whose children habitually wore neither shoes nor stockings during the summer months. A one-ounce metal ointment box was left with the family in which to deposit the feces to be examined.

A total of one hundred twenty-two specimens were received and examined microscopically for hookworm ova within twenty-four hours after they arrived at the laboratory. The flotation method was used, whereby saturated sodium chloride solution was mixed with a small amount of feces, a glass slide, placed over the container just touching the mixture. After leaving the slide in place a few minutes to allow some of the ova, if they were present, to collect on the surface, the slide was examined under the microscope.

No hookworm ova were found. Since all specimens were carefully selected the conclusion that hookworm infestation does not exist in Delaware seems justified. It is possible that a few individuals infested with hookworms may come into the state from infested areas from time to time, yet conditions are not favorable for the development of hookworms, therefore it is our opinion that hookworm infestation is not and is not likely to be a public health problem in this state.

Ova of other intestinal worms were found in several specimens. These were *ascariis lumbricoides* (round worm), *trichuris trichiuria* (whip worm), *enterobius (ozyuris) vermicularis* (pin or seat worm) and *hymenolepis nana* (dwarf tapeworm). It is not surprising that these were found, because they are all cosmopolitan in their geographical distribution.

## PULMONARY TUBERCULOSIS IN CHILDHOOD

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The various organizations in the state which are in contact with tuberculosis have realized for some time past that the problem of case finding among the school children has been a neglected part of a complete tuberculosis program.

In former years it was thought that no tuberculous case-finding program was complete until all of the under-nourished and under-weight children had been carefully examined for evidence of this disease, as the opinion was advanced that to find childhood tuberculosis one must search carefully among this group of children.

During the past two or three years several enlightening articles have been written on the results obtained following the tuberculin test on children and subsequent xray of all the reactors. Consequently, the present opinion as regards tuberculosis in childhood has undergone quite drastic changes, and definitely shows that there is no relationship between malnutrition and latent tuberculosis, as recent observations, based upon examination of several thousand school children by the Henry Phipps Institute in Philadelphia (Drs. Opie, Landis, McPhedran, and Hetherington), in Massachusetts (Drs. Chadwick and Zacks), and in Minnesota (Dr. J. A. Myer), advance the following deductions:

1. That the incidence of malnutrition was about the same in children who failed to react to tuberculin, as in the reactors, and that there was apparently no increase in its incidence among children in whom tuberculosis of the tracheo-bronchial lymph nodes was demonstrated.

2. There is no evidence to prove that a malnourished child infected with tubercle bacilli is any more certain to develop tuberculosis than one that is well nourished.

3. There is no proof that malnutrition is either an important cause or effect of latent tuberculosis in childhood. The diagnosis of latent tuberculosis in childhood based upon underweight, fatigue, listlessness, variable temperature, and palpable cervical lymph nodes, is unwarranted.

4. Again, a diagnosis based on physical examination cannot always differentiate tuberculosis from non-tuberculous lesions of the lungs.

It is obvious that if these latent tuberculous lesions continue to spread they sooner or later will become manifest and produce the tuberculous symptomology; that is, loss of weight, malaise, fatigue, temperature elevation, etc.

From these conclusions a child who presents symptoms of under-weight, cough, fatigue and temperature elevation should be tuberculin-tested, and xray films taken if found to react before a diagnosis is made of latent tuberculosis.

The tuberculin test (Mantoux) is quite reliable as to whether or not infection has taken place. Of course, all reactors do not have clinical lesions, and so by the xray examination of these reactors one is able to differentiate the clinical from the non-clinical case of tuberculosis. Statistics show that the incidence of latent tuberculosis is approximately four times greater among the definitely known contact cases.

Dr. F. Maurice McPhedran, of the Henry Phipps Institute, gives the following classification of the demonstrable lesions on stereorontgenograms:

A. Focal tuberculosis, caseous or calcified nodule.

B. Tuberculous consolidation of a lobe or wedge, progressive or unstable. Calcified spots remain if it clears.

C. Tuberculous consolidation of a lobe or wedge, retrogressive and benign. Few strands remain when it clears.

D. Diffuse, childhood type of tuberculous infiltration. Confluent broncho-pneumonia is the serious lesion of this type and often precedes E.

E. Miliary tuberculosis.

F. Tuberculosis of the tracheo-bronchial lymph nodes, uncalcified.

G. Tuberculosis of tracheo-bronchial lymph nodes, calcified.

H. Apical, adult-type infiltration of children and adolescents.

Until recently this phase of the work had not been attempted, due to lack of necessary funds, personnel, xray facilities, and no hospital accommodations for the treatment of the active cases.

By means of an appropriation by the last legislature, Brandywine Sanatorium is now equipped for xray study of the chest. Also, this past year, the Delaware Anti-Tuberculosis Society set up in their budget moneys for use for case-finding among school children and contacts with tuberculosis.

A conference was held, at which time it was decided that as only about three hundred children could be xrayed with the present funds, the case-finding would probably be greater among the children who are or have been in contact with known cases of tuberculosis. It was thought advisable that this preliminary work should include school groups of the entire state, but separated so that a rough cross-section of the entire state might be obtained. With this in view, Claymont, two groups from Wilmington (white and colored), Milford, and Delmar were selected.

It was further decided to tuberculin-test (Mantoux) all available children in these groups who are or have been in contact with known cases of tuberculosis and take stereoscopic films on all of the reactors.

A tabulation of this work, which has just been completed, is given herewith.

The routine one hundred and seventy-one represents the cases who are known contacts of tuberculous patients and who have been xrayed at the Sanatorium during the past year, and who are not included in any definite school group. Also, the figures in this group of one hundred seventy-one may be accounted for as being somewhat higher than the rest of the groups, probably due to the fact that there are included in this group children who are much older than those in the various school groups.

Referring to the table, one will note that it is recommended that the childhood and adult types of tuberculosis, and those with soft glands and nodules, should receive active treatment. This probably should be modified, as undoubtedly some of the lesions discovered were evidence of past infection with no present activity, and one xray film should be no absolute judge as to the need of treatment. Probably the most satisfactory procedure with all of these types of lesions would be hospitalization for further study.

The strands and suspects, of course, need future xray study. The presumably non-tuberculous pathological lesions found in the chest were

	Number tested	Number reactors	Number x-rayed	Healed glands and nodules	Soft glands or nodules	Strands	Childhood type	Adult type	Suspect	Non-T. B.
Routine.....			171	29	6	11	8	12		12
No. 29 School, Colored..	104	37	33	9		2		4		3
Claymont.....	80	26	25	1	1	2	1	2		2
Milford.....	58	30	30	5	1	4		1	2	
Delmar.....	65	17	17	1	1	2	1			1
830 Kirkwood, Wilm....	18	11	11				2			
St. Peter's.....	71	36	36	8		4	2	3	2	2
Totals.....	396	157	323	53	9	25	14	22	4	20
Totals needing active treatment.....	45				9		14	22		
Totals needing observation.....	29					25			4	
Total.....	74									

recommended to have a nose and throat examination, as it is a known fact that quite often discharging sinuses and enlarged tonsils will cause secondary lung conditions.

It is understood that, due to the few who were examined, this should not serve as a basis on which to judge the entire school group of this state, but rather it does clearly emphasize the

need for further work along this line on a much larger scale.

It is hoped that within the next year this type of work can be carried on more extensively, as plans are now under way for a forty-bed children's building at the Sanatorium, so that the active cases when found can adequately be taken care of in the future.

THE WHITE HOUSE CONFERENCE

E. F. SMITH, M. D.

Georgetown, Del.

The "White House Conference," called by President Hoover to assemble in Washington, November 19-22, 1930, "to study the present status of the health and well-being of the children of the United States and its possessions; to report what is being done; to recommend what ought to be done and how to do it" was the third National Conference to be called for this purpose. The first was called by President Roosevelt in 1909; the second by President Wilson in 1919.

The wisdom of calling these conferences be-

comes more apparent as the facts relating to American children are brought to light by investigators on the different committees. These committees reported that of the 45,000,000 children in the United States:

- 35,000,000 are reasonably normal.
- 6,000,000 are improperly nourished.
- 1,000,000 have defective speech.
- 1,000,000 have weak or damaged hearts.
- 675,000 present behavior problems.
- 450,000 are mentally retarded.
- 382,000 are tubercular.
- 3,000,000 have impaired hearing.
- 18,000 are totally deaf.
- 300,000 are crippled.
- 50,000 are partially blind.

200,000 are delinquent.

500,000 are dependent.

On the basis of population, and assuming conditions in Delaware are about average for the country, the figures for Delaware are as follows: According to the 1930 census, there were 81,000 children in Delaware, so there would be:

- 63,000 reasonably normal.
- 10,800 improperly nourished.
- 1,800 with defective speech.
- 1,800 with weak or damaged hearts.
- 1,200 with behavior problems.
- 810 mentally retarded.
- 680 tubercular.
- 5,400 with impaired hearing.
- 33 totally deaf.
- 540 crippled.
- 90 partially blind.
- 25 totally blind.
- 360 delinquent.
- 900 dependent.

These figures, owing to present economic conditions, are perhaps considerably increased at the present time, especially the number of improperly nourished, and as a result, tuberculosis, and dependency. This does not take into account the very large number of children who have defective teeth and diseased tonsils.

Unfortunately, a very large proportion of the children who are deficient are in the families of the poor, who are utterly unable to have the defects corrected, much as they would like to.

This is the responsibility of Delaware, and, if conditions are improved, the people of Delaware must do it. The function of the "White House Conference" was to find out the conditions as they exist and outline a program, at least, for the betterment of the conditions of the American child.

In order to further this project in Delaware, a conference was called by Governor Buck to meet at Dover, on April 30th of this year, at which committees were appointed to further the various phases of the work. The object to be attained is splendidly set forth in the "Children's Charter" adopted by the "White House Conference."

#### THE CHILDREN'S CHARTER

I. For every child spiritual and moral training to help him to stand firm under the pressure of life.

II. For every child understanding and the guarding of his personality as his most precious right.

III. For every child a home and that love and security which a home provides; and for that child who must receive foster care, the nearest substitute for his own home.

IV. For every child full preparation for his birth, his mother receiving prenatal, natal, and postnatal care; and the establishment of such protective measures as will make child-bearing safer.

V. For every child health protection from birth through adolescence, including: periodical health examinations and, where needed, care of specialists and hospital treatment; regular dental examinations and care of the teeth; protective and preventive measures against communicable diseases; the insuring of pure food, pure milk, and pure water.

VI. For every child from birth through adolescence, promotion of health, including health instruction and a health program, wholesome physical and mental recreation, with teachers and leaders adequately trained.

VII. For every child a dwelling place, safe, sanitary, and wholesome, with reasonable provisions for privacy; free from conditions which tend to thwart his development; and a home environment harmonious and enriching.

VIII. For every child a school which is safe from hazards, sanitary, properly equipped, lighted, and ventilated. For younger children nursery schools and kindergartens to supplement home care.

IX. For every child a community which recognizes and plans for his needs, protects him against physical dangers, moral hazards, and disease; provides him with safe and wholesome places for play and recreation; and makes provision for his cultural and social needs.

X. For every child an education which, through the discovery and development of his individual abilities, prepares him for life; and through training and vocational guidance prepares him for a living which will yield him the maximum of satisfaction.

XI. For every child such teaching and training as will prepare him for successful parenthood, homemaking, and the rights of citizenship; and, for parents, supplementary training to fit them to deal wisely with the problems of parenthood.

XII. For every child education for safety and protection against accidents to which modern conditions subject him—those to which he is directly exposed and those which, through loss or maiming of his parents, affect him indirectly.

XIII. For every child who is blind, deaf, crippled, or otherwise physically handicapped, and for the child who is mentally handicapped, such measures as will early discover and diagnose his handicap, provide care and treatment, and so train him that he may become an asset to society rather than a liability. Expenses of these services should be borne publicly where they cannot be privately met.

XIV. For every child who is in conflict with society the right to be dealt with intelligently as society's charge, not society's outcast; with the home, the school, the church, the court and the institution when needed, shaped to return him whenever possible to the normal stream of life.

XV. For every child the right to grow up in a family with an adequate standard of living and the security of a stable income as the surest safeguard against social handicaps.

XVI. For every child protection against labor that stunts growth, either physical or mental, that limits education, that deprives children of the right of comradeship, of play, and of joy.

XVII. For every rural child as satisfactory schooling and health services as for the city child, and an



extension to rural families of social, recreational, and cultural facilities.

XVIII. To supplement the home and the school in the training of youth, and to return to them those interests of which modern life tends to cheat children, every stimulation and encouragement should be given to the extension and development of the voluntary youth organizations.

XIX. To make everywhere available these minimum protections of the health and welfare of children, there should be a district, county, or community organization for health, education, and welfare, with full-time officials, co-ordinating with a state-wide program which will be responsive to a nation-wide service of general information, statistics, and scientific research. This should include:

(a) Trained, full-time public health officials, with public health nurses, sanitary inspection, and laboratory workers.

(b) Available hospital beds.

(c) Full-time public welfare service for the relief, aid, and guidance of children in special need due to poverty, misfortune, or behavior difficulties, and for the protection of children from abuse, neglect, exploitation, or moral hazard.

FOR EVERY CHILD THESE RIGHTS, REGARDLESS OF RACE, OR COLOR, OR SITUATION, WHEREVER HE MAY LIVE UNDER THE PROTECTION OF THE AMERICAN FLAG.

The first "White House Conference" was concerned with the dependent child. The second was enlarged to include under five sections: economic and social basis for child; welfare standards; child labor; health of children and mothers; children in need of special care; and standardization of child welfare laws. The third conference included the subjects in the two former ones, but the range was enlarged to take in not only the dependent child or the child in special need of protection, but all children in their total aspects, including those social and environmental factors which are influencing modern childhood.

In Delaware, many of the things recommended by the "White House Conference" have been undertaken by the State Board of Health and some of them carried a long way. Among them are:

*Prenatal Care*—All physicians and midwives are urged to report prenatal cases to the State Board of Health. These are visited from time to time by the nurses, who assist in carrying out instructions given by the physician. Prenatal letters are sent from the department to the expectant mothers each month until delivery. Prenatal clinics are held in Wilmington and Laurel, and we are in need of more of them.

*Care of Infants*—As soon as practicable after a birth is reported, a nurse visits the home and instructs the mother in the care of her baby.

Clinics are held weekly in different towns in the State and in Wilmington, at which babies are weighed, measured, and in the case of babies which are not doing well, the mother is advised to have her physician see them.

*The School Child*—The summer round-up, sponsored by the Parent-Teacher Association, is made each summer. A physical examination is made of each child and its defects reported to the parents.

Periodic physical examinations are made of each school child in the state, its defects noted and reported to the parents with recommendation that they have their physician, oculist, or dentist see the child. Many defects are corrected, but owing to lack of sufficient nursing staff to do the follow-up work, and lack of facilities for taking care of the defects of the children of indigent parents, it has been impossible to have corrections made.

*Communicable Disease Control*—The standards adopted by the American Public Health Association are followed in preventing the spread of communicable diseases in Delaware.

*Diphtheria*—Since 1926 approximately 65,000 children in Delaware have been given the immunizing treatments for diphtheria. Unfortunately, the greatest number of non-immunized children are in the age group (6 mos. to 6 yrs.) in which diphtheria is most prevalent and most fatal. Clinics are being held in different towns in the state, and in Wilmington, and parents are urged to bring them to the schools when the work is being done there, until such time as it shall become the routine practice of physicians to immunize each baby when it is six or nine months of age.

*Smallpox*—Vaccination for smallpox is not compulsory in Delaware, except that in Wilmington, Claymont and Lewes it is compulsory before a child starts to school. It is, therefore, not a routine practice for the State Board of Health to vaccinate against smallpox except upon request, and contacts. We have so few cases of the disease in Delaware that it has not become a major public health problem.

*Tuberculosis*—Tuberculosis work in the state compares favorably with that of other states in the Union and the practices recommended by leading public health authorities. Clinics are held at towns which are easily accessible to every part of the state, to which physicians may send

their cases and suspects for examination, and to which all contacts are urged to come for examination. Sanatorium treatment is available for cases needing it. Nurses visit the cases who are being treated at home to assist in the carrying out of the physician's orders.

Particular attention is paid to the protection of children in homes where there is a tubercular patient. If it meets with the approval of the attending physician, every effort is made to get the patient to take sanatorium treatment; and if this is not possible, isolation, proper care of sputum, etc., are insisted upon. Mantoux testing, with xray of those who react, is being undertaken in selected groups of school children.

*Typhoid Fever*—When a case of typhoid fever is reported, it is promptly investigated with the object of finding the source of the disease and preventing the spread by contact. Other members of the family and contacts are immunized. Carriers are looked for as they are in cases of other diseases, particularly diphtheria and scarlet fever.

*Oral Hygiene*—The legislature of 1930-31 passed a bill adding an Oral Hygiene Department to the State Board of Health. This began to function with the beginning of the last school year. It provided for five field workers in the counties (two in New Castle, one in Kent, and two in Sussex) and two in Wilmington. These hygienists worked in the schools, examining and cleaning teeth, instructing children in the care of the teeth and reporting defects to parents. Many corrections have been made, but here again the question of having defects in the indigent arises.

Summary of needs from health standpoint:

I. Prenatal clinics established in places accessible to every part of the state.

II. Clinics for removal of tonsils in indigent cases.

III. Dental clinics in the large schools of the state, where dental work for the indigent may be done.

IV. Venereal disease clinics in connection with prenatal clinics.

V. Better supervision of nutritional work in schools.

VI. Mantoux testing of children who are tuberculosis contacts, and xray of those who react.

VII. Provision for follow-up work in connection with physical examinations of school children, and oral hygiene work.

## SOCIAL INSURANCE

EDWARD H. OCHSNER, M. D.  
Chicago, Ill.

### QUALITY OF MEDICAL SERVICES DETERIORATES UNDER COMPULSORY HEALTH INSURANCE

In preceding articles Social Insurance as a whole has been considered. In this and subsequent articles our observations will deal more particularly with Compulsory Health Insurance, one phase of Social Insurance. The chief danger to medical progress and efficient medical service to the American public comes from that small group who wish to establish lay bureaucratic control over the private practitioners of medicine and dentistry.

The state exercises a legitimate and proper function in public hygiene and sanitation, the teaching of personal hygiene in schools and colleges, in the medical care of paupers, criminals, and the indigent in general, but whenever and wherever it has entered into the private practice of medicine it has always resulted in inefficiency. Even in institutional work, with the possible exception of university clinics, the medical service rendered by the government is rarely excellent or even good, nearly always mediocre and oftentimes even worse.

The health, happiness, prosperity, and efficiency of the citizenship of any nation depends more upon the integrity, ability, unselfishness, and enthusiasm of the medical and dental professions and upon the quality of medical and dental services rendered to the people than upon any one other factor. Any change in the practice of medicine and dentistry which will in any way hinder these professions from giving their best services will eventually react unfavorably upon the whole nation. That state medicine and Compulsory Health Insurance actually will and do lower the general quality of medical and dental services is supported by reason and experience. While it may level up a little from the bottom it unquestionably levels down from the top and it is this leveling down that will surely stop medical progress.

Medical progress depends not so much upon the rank and file of the profession as upon occasional great men with vision. If we unduly hamper these great medical minds, medical progress must cease. The quality of medical services received by the people in general de-

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# EDITORIAL

## DELAWARE STATE MEDICAL JOURNAL

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### MATERNAL MORTALITY

A very good example of an unlooked-for or little appreciated relationship between statistical rates, ordinarily considered as having little in common, is that of the relationship between the maternal mortality rate and the birth or marriage rates of any community. One might not at first appreciate what is, however, an indisputable fact, that there is a distinct tendency for the maternal mortality rate of a community to be high, if there is a low or falling marriage rate or especially a low or falling birth rate.

A community with a falling marriage rate, if the fall is not due to such a cause as the relative stringency of its marriage laws, is experiencing as well an appreciable degree of postponement of marriage to the later age groups. This in

turn brings it about that primipara are relatively older, that labors are more prolonged and difficult, and that there are fewer children in the family. The relatively large number of difficult labors is a cause of elevation both of the maternal and infantile mortality rates.

The number of primipara who are safely delivered is proportionately less than the number of women who safely give birth to their second child, and this latter is less than the number of women safely having their third. With the third child, the death rate is usually at the lowest point of the curve, rising thereafter, eventually to equal the height found for primipara. So, the more first children there are being born in a community and the greater the age of the mother when that first child is born, the higher the maternal mortality rate is apt to be.

This fact is to be borne in mind in any consideration of the maternal mortality rate of this state. The marriage rate has been progressively dropping, and this not entirely due to the fact that neighboring states have less stringent laws respecting marriage, and have well recognized Gretna Greens. The birth rate also has been falling, becoming less almost regularly every year. We might expect, under these circumstances, to find that marriages are being deferred beyond the ages at which marriages usually take place, and consequently that primipara are of an age beyond that at which first children are usually born. Both of these conditions tend to heighten the maternal mortality, as they do the infant mortality.

### ARE THERE TOO MANY PHYSICIANS?

There are few issues of any medical journal on the pages of which some discussion of some aspect of this question does not appear. A favorite method of approach is the statistical method, a laboriously calculated statement of the number of practicing physicians in certain units of population, their average incomes and the rates at which the numbers are increasing and the incomes lessening. Then deductions follow, seemingly as many and as different as there are different writers.

If there is any practical result from the de-

ductions, it seems to be most plainly evident in the lengthening periods of study which the universities are adopting, the higher standards imposed on students intending to enter upon the course of study which will eventually, after various vicissitudes, enable them to write the magic letters "M. D." (or their equivalents) after their names, and a general disagreeable feeling that there is an over-production of physicians as there is of automobiles, of peaches, of milk, and of coal.

There is in respect of any of the group of necessities or luxuries above mentioned by no means a similar amount of prominence given to the fact that there are many individuals whose lives would be broadened could they be placed in possession of some means of transportation other than that which they received from nature, that while peaches and other fruit rot in the orchards or on the shelves of the dealer, there are many who would, if they could, thoroughly enjoy the deliciousness now denied to them, that there are thousands of children who would profit from the use of the surplus milk could they but obtain it, and that idle or shivering multitudes would gladly make use of the coal to their profit or pleasure. Those there are whose claim it is not that there is over-production of the articles named, and many more, but that the breakdown has occurred in these not having been made available at reasonable cost to the masses whose need of them no one can deny.

Though the analogy between the use of these commodities and the provision of medical services cannot be close, at least it can be argued on grounds which are very tenable that there is a similarity, at least in breakdowns.

There never was a time when more could be done by medical practitioners to make more easy and more safe the pathways of those about them. There never was a time when the need of their assistance was more thoroughly appreciated by so many people. There never were so many and so carefully trained physicians, with so many and so complete facilities for transmitting to those about them the advantages of their skill in combatting disease and safeguarding health. So much is evident and obvious, as apparent as that which must also be conceded, that from some cause there has been a breakdown, in that there has not been made available to many who sadly

need it, the skill so near at hand, at such rates of compensation which the ones could afford and the others could accept.

That, more than disease control, is the medical problem of the immediate future.

#### ARE THERE TOO MANY NURSES?

Here we enter upon an entirely different field. It would be difficult indeed to contend that the student entering upon a course of study which eventually may qualify him for practice, and the nurse but recently accepted at a training school, approach their new duties in the same way, or have in mind the same or even similar intentions. The student is usually from the commencement of his course definitely committed to a certain future, and, barring any interferences which may prevent his completing his period of study, the practice of medicine will be his life's vocation. Relatively few of those who finish their courses and obtain their degrees later enter other professions or businesses. To a large number of the entrants of the training schools for nurses their new experiences are much more episodal.

Eventually, the proportion is not small of these who move on from the status of nurse to that far higher field of presiding at the hearth and in the home of some individual who without a doubt highly appreciates his superlatively good fortune. Many even achieve that highest of all destinies, motherhood, and there can be no individual better trained or qualified for motherhood than one who has mastered for the benefit of others the precepts which now she herself is being permitted to use to profit. If all the mothers of our land had had adequate nursing training and profited from that training, the public health problems of reducing maternal and infant mortality would be near solution. Safeguarding the health of the home is almost entirely the woman's, the home-maker's, readily assumed prerogative, a prerogative which, under these circumstances, would be exercised to great profit.

Even as it is, it is interesting to conjecture concerning the extent to which the public health improvement of recent years has depended upon the fact that there have been sent out from our hospitals and training schools thousands of individuals who, each in the sphere of life which she was destined to fill, could be and usually was a center of knowledge for every other mother



and home-maker with whom she was brought into contact. It would not be surprising if some enterprising statistician some day presents an elaborate calculation measuring precisely—and the measurement would be astonishing in its magnitude—how much society has profited from this circumstance.

So the answer seems obvious: there cannot be too many nurses, and transitory plethoras in the ranks of those who desire to use their knowledge for mere monetary gain signify little or nothing as opposed to the tremendous returns which our social structure has received and is destined to receive.

### SOCIAL INSURANCE

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pend in large measure upon the quality of teaching which the rank and file of the profession receive and upon the enthusiasm and the ideals which are instilled into them by their teachers. Men of great ability can do their best work only if absolutely free, and a physician under lay bureaucratic control never is entirely free. Andrew Carnegie, one of the most successful men of modern times in the best sense of that word, makes the following statement in his autobiography: "Thereafter I never worked for a salary. A man must necessarily occupy a narrow field who is at the beck and call of others."

One of the continually recurring misstatements in the Compulsory Health Insurance propaganda is that it encourages personal hygiene and consequently disease prevention. Nothing could be farther from the actual facts. Which person is more likely to take care of his teeth—the one who gets his dental services free, or the one who has to pay for it out of his own pocket? Those who claim the former just do not know human nature.

One of the chief causes of wonder of the Germans during the World War was the splendid condition of the teeth of the American soldiers as against the almost universally poor teeth of the Germans. Why this great difference? The chief and principal reason is that American citizens have their teeth taken care of by private dentists who take a very personal interest in each individual patient. Most American dentists and physicians are spending much of their time instructing their patients in general and oral hy-

giene. Contrast this with the work of the "Krankenkasse" physician of Germany who asks his patient one or two questions, then reaches into a file, hands him a typewritten prescription and gets rid of him just as quickly as he can and as he must, if he is to see fifty patients in an afternoon office period of two hours; and this he is by force of necessity compelled to do if he is to make a living for himself and his family at twelve cents an office consultation. Then again the claim is made that Compulsory Health Insurance examinations are more thorough. This, too, is a statement contrary to fact and to reason when one realizes that the sort of office consultation above described gives the physician the same pay as a thorough physical examination does. No man can afford to make a careful, painstaking examination for twelve cents—not even in Germany, where living expenses are almost as high as in this country. One "Krankenkasse" physician in Berlin told me personally that he made twenty-three house calls in four and one-half hours or at an average rate of one in a little less than twelve minutes, driving from house to house, going up from one to four flights of stairs each time, examining a patient and prescribing for him.

Brend states that in England the average time spent by panel physicians in making a diagnosis is from three to four minutes. Another English writer in commenting on the above facts rightly observes that these are not abuses of Compulsory Health Insurance but inherent faults of the system.

We have all repeatedly seen and heard the statement that seventy per cent of the American people—namely, the low and moderate income classes—are not getting adequate and efficient medical services. Where those who make this statement get their statistics no one has ever been able to find out. The fact is that there are no statistics available on this point. From this it must be evident that the only place they can get these figures is from the depths of their fertile imaginations.

If we stop to investigate the source of these statements, we invariably find that they emanate from two classes of individuals—namely, a certain type of ultra-medical specialist whose only experience is or has been with the extremely rich whom he charges fancy, exorbitant fees and with paupers whom he treats in charity hospi-

tals. As a consequence he has had no personal experience with patients with moderate incomes and has no right to express an opinion on this subject. The other class who repeat these figures are usually persons who never have had personal experience with the practice of medicine and hence their opinions are practically worthless.

I maintain that the poorer classes of patients get better services in this country than they do in those countries of the world that have Compulsory Health Insurance and that their medical requirements are at least as efficiently met as are their food, clothing and particularly housing requirements. This phase of the problem is an economic one and cannot be solved by a palliative such as Social Insurance is.

Some fifteen years ago, when the prices of eggs and chicken feed were at their highest, I wrote my farmer and asked him why he was not sending us any eggs. I received the following laconic answer: "The pullets look good but lay no eggs." Superficially examined, Compulsory Health Insurance "looks good" but unlike my pullets it has laid many eggs, most of which are added.

When we substitute governmental control in medicine and dentistry for independent individual action, we stifle self-expression, individuality, initiative, courage, confidence, enthusiasm, and industry. We, as a nation, are on the whole already over-standardized. The very ones who wail the loudest about the evils of mechanization are often the very ones who clamor the most for more government control. Excessive bureaucratic and lay control have much the same spiritual effect upon the professional man as over-mechanization has upon the intelligent craftsman. They both have a tendency to crush out fortitude, ingenuity, and pride of achievement in those engaged in these vocations. With some, standardization has become almost a fetish in spite of the fact that when pushed too far it always results in mediocrity. The efficient successful practice of medicine always has been and always will be a personal unstandardized affair.

That the quality of medical services has deteriorated in those countries which have Compulsory Health Insurance is due to many causes among which may be mentioned the excessive number of calls upon the time and energy of

the physician. Those who receive free medical rather conclusively that medical services in the services are constantly running to the physician for every trifling ailment or compelling the physician to make many unnecessary calls at the homes. Every "Krankenkasse" physician who has been interviewed has stressed this fact. Baeumer states in his book that between sixty-five and seventy per cent of all calls are unnecessary, consume the time and energy of the physician and the resources of the "Krankenkasse," and prevent adequate medical services and hospital care to the really sick. Liek in his book says the number of trivial conditions such as "microscopic skin abrasions, etc.," disgusted him so much that he retired from the service. This abuse has grown to such proportions in Germany that the government department has been compelled to issue new regulations to the effect that the insured have to pay a certain fee out of their own pockets for each prescription. This again has given rise to new abuses. A common sequence of new regulations to correct one abuse is to create an opportunity for newer ones. In England unnecessary night calls became so common that many panel physicians disconnected their phones between ten o'clock P. M. and seven o'clock A. M. A fine state of affairs if a patient has a strangulated hernia or an attack of gall stones, of acute appendicitis at midnight! We have all repeatedly seen and heard the statement that the workers of this country do not have medical services when they most need them—namely, at the beginning of an illness. The claim is made that were prompt services available at this time much serious illness could be avoided. Conclusive proof that private practice is more prompt than Compulsory Health Insurance practice is evidenced by the practice in England of avoiding night calls, and by the fact that the percentage of pus appendix cases, which necessitate draining, is much greater in Germany than in the United States. We all know how the mortality rate is increased by letting acute appendix cases progress to suppuration before they are operated and how much longer the period of hospitalization is in suppurative cases. If acute illnesses had more prompt and more efficient treatment in Germany, for instance, than in the United States, suppurative appendix cases should be much less frequent, the mortality rate should be lower and the morbidity shortened. As a matter

of fact, the reverse is the case, which proves United States are more efficient than those in Germany. Such abuses result in endless rules and regulations. Rules that accomplish little except to cramp the individuality and personality of the conscientious physician, wear him out with paper work and leave little time and energy for professional study and advancement. One official described his plight in the following words:

"I've settled into official routine; I'm fixed there hard and fast. It's so with many of us. Most of us recognize the hopelessness of ever pulling out. As I sometimes confess, I am merely one of the unburied dead."

That Compulsory Health Insurance does not in fact prevent sickness nor reduce economic loss as the result of sickness is also proven by the following facts: Before the World War the average loss of time for sickness of the American laboring man was six and two-tenths (6.2) days per year; the German's, nine and two-tenths (9.2) days; the Austrian's, nine and five-tenths (9.5). We are credibly informed that since 1923 the loss of time in Germany has increased another eighty per cent above the nine and two-tenths (9.2) so that it now stands at approximately sixteen and five-tenths (16.5) as against six and two-tenths (6.2) in America. A fine showing for Compulsory Health Insurance after forty-eight years of operation!

Let us see what some of the German and English think about the scheme. A high-salaried German health insurance official said the following in 1927: "Health insurance is the oldest branch of German Social Insurance. The sickness insurance law of June 15, 1883, was the corner-stone of the proud building for which we were envied by foreign nations before the war. Unemployment insurance will, I hope in the near future, be the capstone of the building." To which Edwin Liek, a practicing physician of Danzig, makes the following retort: "This is an expression familiar to physicians, words that we have frequently heard during the past four decades. Only now they affect us differently. In the beginning the doctors believed these dulcet tones; today only *parasitic physicians* or *pure*

*fools* join in this festive song." And again he says, "Social insurance is today organized to fill the feed trough of *bureaucratic drones*." At a recent meeting of the Trade Union Council in Nottingham, England, a resolution was passed unanimously demanding that the government overhaul the Department of National Health.

That the average American citizen is getting better medical services than are the citizens of those countries which have had Compulsory Health insurance the longest, is borne out by the cited statistics, the quoted opinions as well as by a rather extensive personal experience both in this country and in Central Europe.

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## MISCELLANEOUS

### The Dilemma of Listerine

When Congress, which on occasion has attempted to practice medicine, enters into any medical field it is likely to confuse the situation somewhat. Perhaps the good congressional doctors were not aware, when they were concerning themselves with budget balancing, of the difficulties they were conferring on some of America's leading industrial concerns; for example, the Lambert Pharmacal Company, concoctors of Listerine. Not long ago THE JOURNAL reported the results of the study of this product made by the A. M. A. Chemical Laboratory and the Bureau of Investigation. As a result of this study the opinion was stated that the product cannot be considered in any sense of the word a real germicide and that the claims made for it were hardly justified by available evidence. Now, however, the manufacturer finds himself in a position where it is necessary for him to determine exactly what the product really is good for. Various preparations are taxed according to their uses. The product called Listerine is sold largely as a gargle for sore throats; used in this manner, it is a medicinal agent. Under the new revenue law, medicinal agents are free from tax. However, in order to combat the campaign put forth on behalf of Pepsodent Antiseptic by Amos and Andy, in recent days Listerine has also been widely advertised as a mouth wash. In fact, the technical term "halitosis" was res-

cued from the musty archives of medical dictionaries and made a byword—and a reproach—by the Listerine manufacturers before Pepsodent appeared on the scene. Mouth washes, under the new revenue law, are taxable at 5 per cent. Furthermore, it seems to have occurred to the agency which promotes Listerine that it has usefulness—at least from the advertising point of view—as an after-shaving lotion and that its virtues for the control of dandruff are extraordinary. By such usage the product becomes a cosmetic or toilet article. The toilet goods tax is 10 per cent. What a dilemma! If the Treasury Department asserts that Listerine is a toilet article, it will have to pay 10 per cent; if it is a mouth wash, it will have to pay 5 per cent, and if it is a medicinal agent, it can get off without a tax. We can assure the Treasury Department, as a result of the investigation carried on by the Chemical Laboratory of the American Medical Association, that as a medicinal agent it is not potent enough to be considered seriously. Whether it pays 5 per cent or 10 per cent is for the authorities to decide, but if it really is to be helpful—although somewhat indirectly—to the people who buy it, the bigger the tax the better!—Editorial, *Jour. A. M. A.*, July 9, 1932.

#### **Treatment of Pernicious Anemia With Digested Liver**

C. W. BARNETT and W. M. THEBAUT, JR., San Francisco (*Journal A. M. A.*, August 13, 1932), describe experiments in which they demonstrated that the response of certain patients with pernicious anemia to treatment with liver and liver extract digested in normal gastric juice differs in no particular from what would be expected from the same quantities of liver and liver extract, undigested. These results suggest that the increase in potency of liver when mixed with stomach tissue observed by Walden and Clowes is not alone a result of digestion of liver protein but may be due to a summation of the potent material already present in liver, in stomach tissue and possibly small amounts formed by digestion. The authors are unable to explain the discrepancy between their results and those of Reimann.

#### **OBITUARY**

Dr. Eli Nichols, one of Wilmington's most active physicians, died on July 25, 1932, at Johns Hopkins Hospital, Baltimore, of a heart ailment.

He had been an active member of the staff of the Delaware Hospital, and was house physician for the Home of Merciful Rest.

He was born at Centreville, May 8, 1889, a son of Joseph Palmer and Elizabeth Marshall (Palmer) Nichols, being a member of one of the pioneer families of New Castle County.

He was educated at Friends' School and at George School, Newton, Bucks County, Pa. From there he went to Haverford College, Haverford, Pa., from which he was graduated with the degree of Bachelor of Science in 1912. He then took up the study of medicine at the University of Pennsylvania, receiving the degree of Doctor of Medicine, in 1915.

After having served as an interne, he settled in Wilmington in 1915, where he carried on a general practice until the time his health failed 3 years ago.

He was a member of the American Medical Association, the Medical Society of Delaware, and the New Castle County Medical Society. His social affiliations included the Wilmington University Club, Wilmington Whist Club, Wilmington Country Club, Concord Country Club, and the American Business Men's Club.

Dr. Nichols' only survivor is a sister, Miss Anna Nichols.

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